The magazine for AUSTRALIAN Amateurs

October 2003
Volume 71 No 10

Amateur Radio

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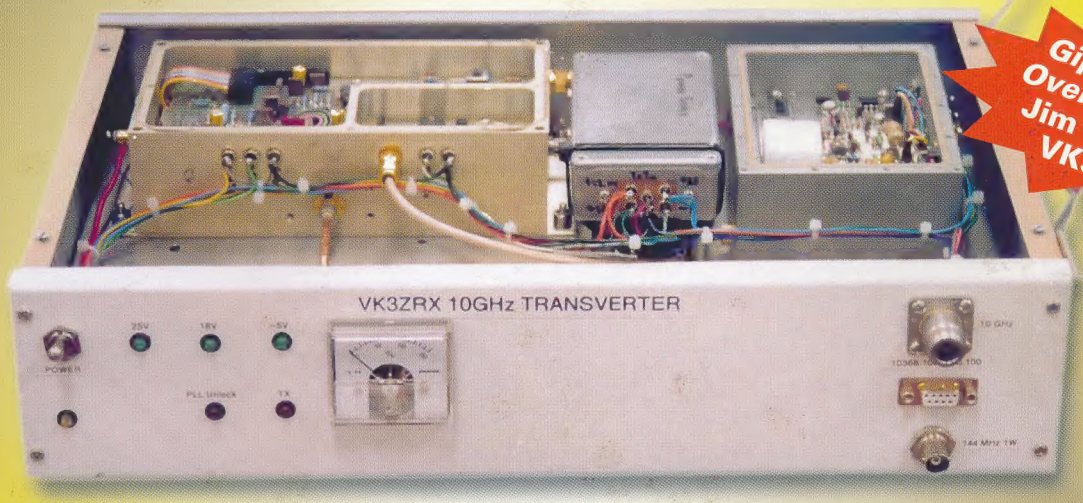

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Amateur Radio

The Journal of the Wireless Institute of Australia

ISSN 0002-6859

Volume 71
Number 10
October 2003

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10/229 Balaclava Road,
Caulfield North VIC 3161
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Production Deadlines

Advertising booking and articles for publication 10th of preceding month.

Hamads and advertising material deadline 18th day of preceding month

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Our Cover this month

GippsTech 2003 featured some outstanding work from homebrewers. See Jim Linton VK3PC's comprehensive observations of the Conference on pages 17, 19 and 28

Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, How to write for Amateur Radio is available from the Federal Office on receipt of a stamped self-addressed envelope.

Back Issues

Back issues are available directly from the WIA Federal Office (until stocks are exhausted), at $4.00 each (including postage within Australia) to members.

Photostat copies

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

Disclaimer

The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for incorrect information published.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

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The Australian Amateur Radio Service

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Editorial Comment

Colwyn Low VK5UE

Changes: do we need 'em?

As I write this, the discussions on the future of Amateur Radio in Australia heat up. Unfortunately some of the comments on the ACA proposal are made without the benefit of explanations of the implications from the ACA. Some of us are continuing to be distrustful of any proposed changes to the legislation under which Amateur Radio in Australia operates and greatly fear the current push by Governments in Australia to privatise anything they can.

My present thoughts are that as Amateurs we have to first make sure we agree on what the Amateur Service is. Is it still well defined by the definition at the top left of this page? Are there some things that require redefinition in the light of 2003 not the reflection of say 1925?

When we are reasonably sure what the Amateur Service is then we can start defining what are the requisites required to join this Service. The next step is to consider the recognition steps in being a member of the Service. Are there development steps? Do we recognise what has been learnt and what has been done? Do we have to demonstrate greater knowledge and responsibility to gain access to the full resources available to the Amateur Service in Australia and the World?

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I have a feeling that if we have these principles clear every thing else will fall into place.

DO NOT FORGET TO REPLY TO THE ACA DISCUSSION PAPER.

There is much concern in our ranks about BPL. Again we need to be properly informed before we make comment. The ARRL and RSGB websites carry information. There has been great concern expressed in Europe. I hate to think what it may do to some of the domestic home entertainment systems in Australia that are not very well designed to deal with electromagnetic interference. If we as Amateurs have trouble with equipment next door or across the street, what will happen to these home entertainment units when the mains is carrying the source?

To move on, there are several activities that might get us motivated to use our frequencies between now and Christmas. There is the Oceanea DX Contest on 4th 5th and 11th 12th October, there is JOTA on October 18th 19th, there is the VHF-UHF Spring Field Day 1st 2nd November and then over December January there is the Ross Hull VHF Contest. If this is not your cup of tea then there are events in all states that are asking for WICEN support. If all else fails then just try and work a few stations each week to check that the gear still works.

My Icom IC-25A should put out 25 watt on high power but when I was moved to check why it was not performing I found it to outputting 1 W low and 3 W high. Took the cover off and after the adjustment pots had been rotated a few times back and forward (I suppose that cleaned the tracks) we were back to 1 W low and 21 W high. Just shows Murphy is still with us.

The next issues of AR will be November, available 1st week November, then a 64 page December issue, available last week in November 2003 and then a January/February issue, available end of January 2004

Happy operating Colwyn VK5UE

ar

WIA Comment

Ernie Hocking VK1LK
Email: president@wia.org.au

The last month has been one almost entirely devoted to the issue of the Federal WIA response to the ACA discussion paper on the future licensing arrangements for the Amateur Radio Service in Australia. However, there has been one other area of interest and concern in the area of Broadband Internet over Power Lines (often seen under the acronyms of PLC or BPL). In recent months the RSGB and ARRL has been battling the matter of BPL in the UK and the US. During this time the WIA has been carefully monitoring the situation here. Of late we have learnt of increased interest in this technology here and have seen some early attempts at evaluation of it along with some deployment of home based use. The use of power lines to distribute broadband internet has the potential to impact on all users of the HF spectrum and the WIA is not alone in its concerns. For those interested, the ACA has recently released a paper on the issue. Further details can be found on the RSGB and ARRL web sites. For those of you with a more technical bent I would refer you to articles in the April and May issues of IEEE Communications.

WIA Response to the ACA Amateur Radio Discussion paper

The WIA Federal council met at Paramatta on Saturday 22 September to discuss the Federal response to the ACA discussion paper. The meeting was attended in person by VK1, VK2, VK3, VK4, and VK5/8. VK6 and VK7 were represented by telephone. The timing of the meeting was such as to allow feedback on the first of the ACA public meetings to be discussed at the meeting as well as discussing the detailed response to the paper.

I am pleased to say that all divisions were in broad agreement across the board in terms of the Federal WIA response. It is important that the Federal response captures the intent of the membership of the WIA. As such the outcomes of the Paramatta meeting will be taken back to the WIA divisions to be presented to the members and further discussion held.

Review of the ACA paper led to the conclusion that most of the proposals were logical outcomes of the recent WRC 2003. There are however a number of areas where the amateur radio community has specific concerns about the proposed changes. These concerns centre around the issue of types of licence and the handling of interference issues.

Types of Licence

It has been WIA policy for a number of years to promote the concept of an Amateur Radio Operator Licence. The operator licence aims to capture the key difference between the Amateur Radio Service (ARS) and other licenses through the recognition of the valuable contribution that the ARS makes to the community. The WIA operator licence proposal was set out in a 1997 submission to the Department of Communications Information Technology and the Arts. The WIA response to the discussion paper will reiterate this position.

The Interference handling proposal

The other area of major concern in the discussion paper was the proposal on how to handle interference in the context of the Amateur Radio Service. The WIA opposes the proposal set out in the paper on a number of social justice and technical grounds. At the meeting though no clear leading alternate proposal was identified. A strategy to define an acceptable alternate proposal was agreed upon and this will be further discussed over the next few weeks in light of the discussions amongst members and the public hearings.

The Australian Entry level licence

The final area of discussion at the meeting was around the details of the proposed Entry level licence. The outcome of the meeting is summarised below:

- That the Entry level licence forms part of a 2 tier system. This would see an entry level licence plus a full call licence. All exiting licenses would be converted to full call privileges on the basis of the similarity of the current novice and full call theory examinations when compared with the Entry licence.
- That the Entry level licensee should be allowed to run 100watts (in line with currently available commercial equipment)
- That the licence should grant access to all modes
- That the following frequency allocation be sought:

Band	Allocation	Rational
1.8 MHz	Nil	To avoid BCI issues
3.5 MHz	All except the DX window	Exclusion of the weak signal segment
7 MHz	7.100 – 7.200 MHz	The band offers both day and night propagation.
14 MHz	Nil	Excluded to offer an incentive for upgrade (This is the main DX band and we need to be conscious of sensitivity to international interworking issues)
21 MHz	All band	
28 MHz	All band	
50 MHz	52Mhz -54MHz	Most of the band excluding the weak signal segments and avoid broadcast TV stations.
144 MHz	144.625 - 145.800	
146.000 - 148.000		Most of the band excluding the weak signal segments
430 MHz	432.625 – 435.000	
438.000 – 440.000		Most of the band excluding the weak signal segments
1.2 GHz	Nil	Excluded to give an incentive to upgrade
2.4 GHz	All	To encourage WLAN experimentation (subject to power limits and weak signal considerations)
5.8 GHz	All	To encourage WLAN experimentation (subject to power limits and weak signal considerations)
10GHz and above		Nil Excluded to give an incentive to upgrade

continued on page 9

An improved coupler for balanced and single-wire feed antennae

Drew Diamond VK3XU
45 Gatters Rd., Wonga Park, 3115.

Deservedly popular all-round HF antennae are the horizontal, or inverted-vee dipole, or horizontal or vertical loop fed with "open-wire" line. The impedance at the station end of the line is usually of unknown value, from perhaps tens, to thousands of ohms, with large frequency-dependent variations, and may be inductively or capacitively reactive. Amateur transmitting amplifiers are ordinarily designed to operate into a low-reactance unbalanced load of nominally 50 ohms. It is therefore not practicable to simply connect such a line to a transceiver and expect effective multi-band operation.

A suitable coupler is required to allow a transmitter to work into, or "see" a 50 ohm resistive load, and thus provide an efficient match between the unbalanced output/input of the radio, and the balanced impedance at the station end of the line. Although it may appear to do so, an antenna coupler at the station end of the line does not "tune" an antenna. The ratio of standing waves upon the feed-line, and ratio of wave distribution upon the radiating wire is not altered when the coupler is adjusted so that the system accepts power.

An open-wire fed antenna uses all of the radiator, from the lowest band, where it may only be a quarter wavelength long, to the highest, where it will be several wavelengths, and therefore have substantial gain in some directions. It does not matter that the feed-line SWR may be high, losses are very low because the dielectric (the material between the wires) is mainly air, and the conductors are of low resistance copper.

Radiation and pick-up from a well balanced line will be negligible, and the antenna will therefore be "quieter" on receive, and radiate very little (from the line) on transmit.

A feed-line is said to be operating in a "balanced" manner when the current in each leg is of the same magnitude but opposite direction, and the voltage is of the same magnitude, but of opposite polarity with respect to earth at all points along the line (Refs 1 and 2). Their respective magnetic and electric fields are then strictly confined to the line.

Quest for the "ideal" coupler

Like most amateurs with a preference for wire antennas, I have a keen interest in the various antenna coupler configurations, and have built many of them in my search for the ideal device (if such a thing exists in reality). Significant variations in measured feed-line current, efficiency and accuracy of balance have been observed between popular circuit types, and some iterations were found to be rather restricted in their impedance matching range.

Very few published designs invite the builder to measure the feed-line current co-incident with minimum coax SWR (but see Ref. 3). A 1 : 1 SWR on the radio/coupler coax may not necessarily indicate the best and only coupler adjustment for a specific band (Ref. 4). In particular, the popular American T-network "Transmatch" was found to be lacking in range, and suitability for balanced line work. Their desperate use of a 4 : 1 "balun" to interface between the unbalanced output of the T-network,

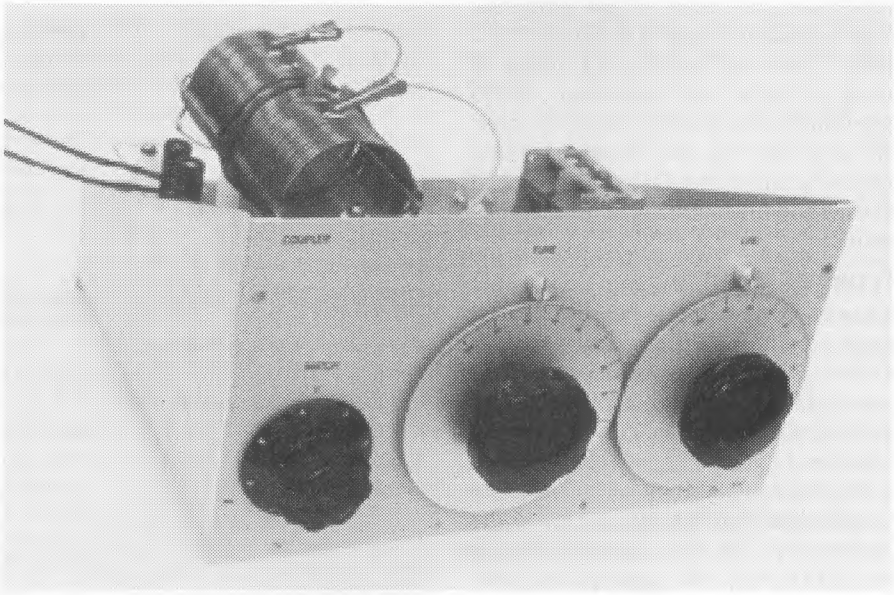

Photo 1: Suggested chassis style.

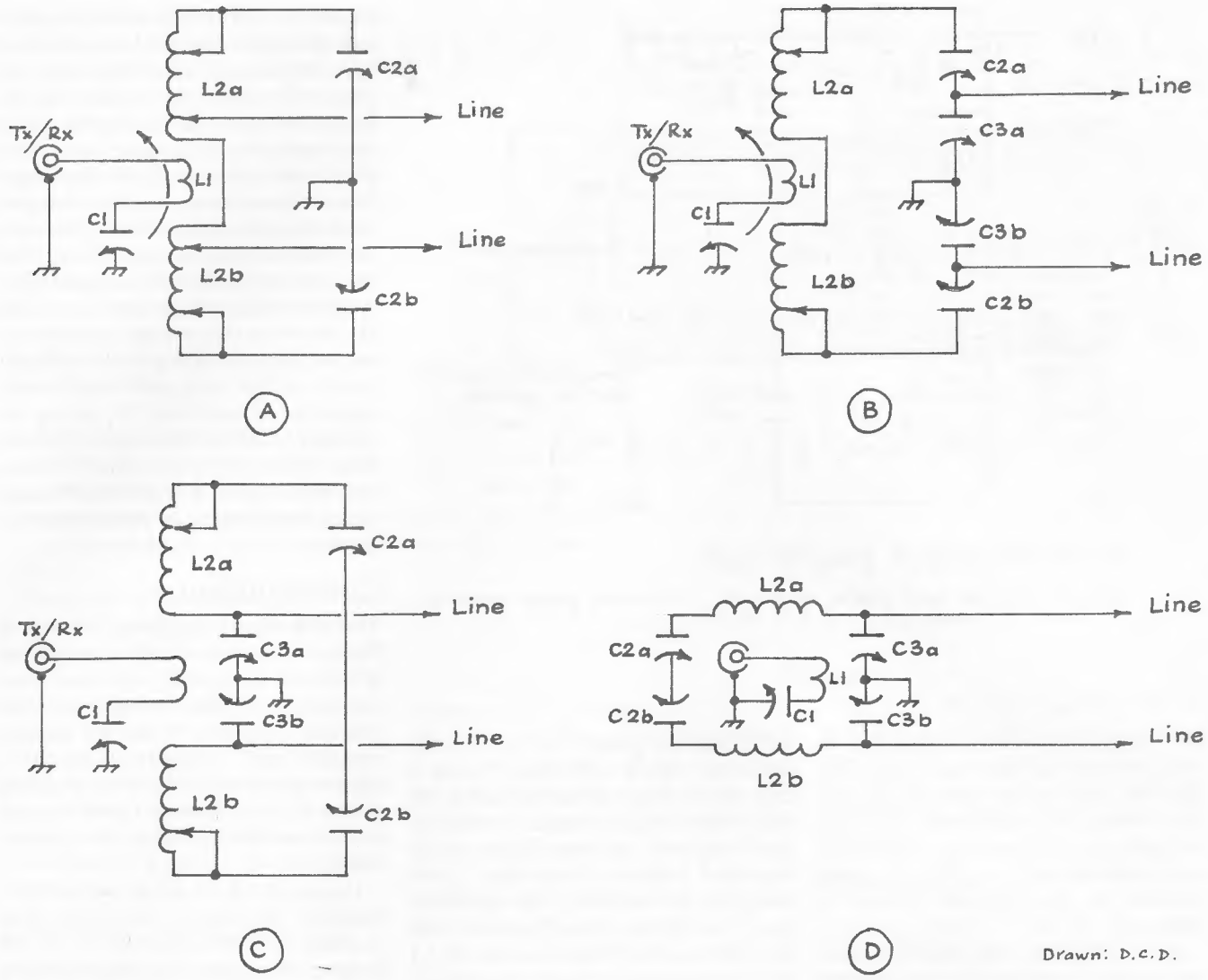

Figure 1

and the balanced, unknown, probably highly reactive feed-line is very questionable. Certainly none of my attempts with various Transmatch and balun configurations would provide a satisfactory match and identical current in each line.

Further efforts here at getting around the problem simply, such as by using a balanced pi-coupler (inductance divided equally) and a choke current balun and/or voltage balun between coax and coupler (Refs. 5, 6 and 7) could not be made to work correctly for every band (due, it is thought, to the imperfection of real baluns).

A truly balanced link coupler (Refs 8, 9 and 10 for example), a type undeservedly absent from the standard radio handbooks for some years now, has four or five, instead of the usual two or three variables, and is therefore capable of efficiently and unambiguously matching our 50 ohms to a very wide range of impedances, both balanced-line and single-wire feed.

The link coupler of Ref. 10 attracted only one criticism, in that there are (admittedly) rather a lot of coil taps required to fulfill the potential matching range. Fortunately, recent work (outlined in Ref 7) is causing a re-evaluation of a neglected circuit configuration. By using a dual-gang variable capacitor instead of the close-spaced coil tappings of the swinging-link model, we obtain improved control over the line matching. Furthermore, a "swinging" link was found not to be necessary, so the number of variables has been reduced from five, to four.

Circuit

The evolution of the improved circuit is illustrated in Fig. 1, where A shows the conventional link coupler. Two series connected coils L2a and b are parallel connected with split-stator capacitor C2a and b, whose rotor (frame) is connected to chassis ground. L2 is gapped so that coil L1 may be coupled at the "zero-RF" potential point in the centre. Swinging-link L1 is mechanically arranged so as to be variable in the degree to which it may be coupled with L2. Capacitor C1 is used to compensate for the reactance presented by L1. Capacitor C2 is tapped across L2 an equal number of turns from the outside of the coil, working inwards as operating frequency is raised (the unused portion of the coil is shorted to prevent parasitic resonances, or "Tesla-

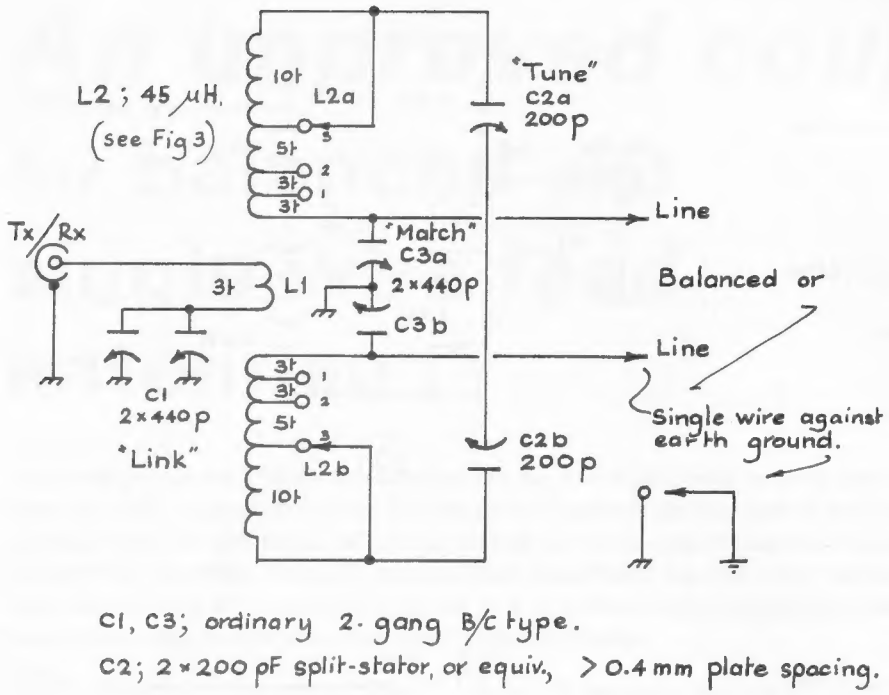

Figure 2

coil" effects). The antenna feed-line is connected to equidistant taps (for balanced line) inside those of C2 at a point where, after adjustment of C1, C2 and swinging-link, feed-line reactance is accommodated and an efficient match between the coax link and antenna is obtained.

Fig 1B shows how the need for close-spaced taps is avoided by the addition of split-stator capacitor C3a and b. C2a and b remain ganged but electrically separate, which effectively forms a capacitive voltage divider across L2. We thus achieve greater control over the line matching ratio. Devotees of the highly regarded Johnson "Matchbox" will recognize the similarity. The Matchbox has C2 and C3 as a dual-differential, with an additional split-stator across coil L2 to re-resonate the network. Unfortunately, capacitor C2 may be tricky to accomplish in practice, and dual differentials are extremely rare items. Furthermore, it is found that L1 still needs to be a swinging or switchable turns link.

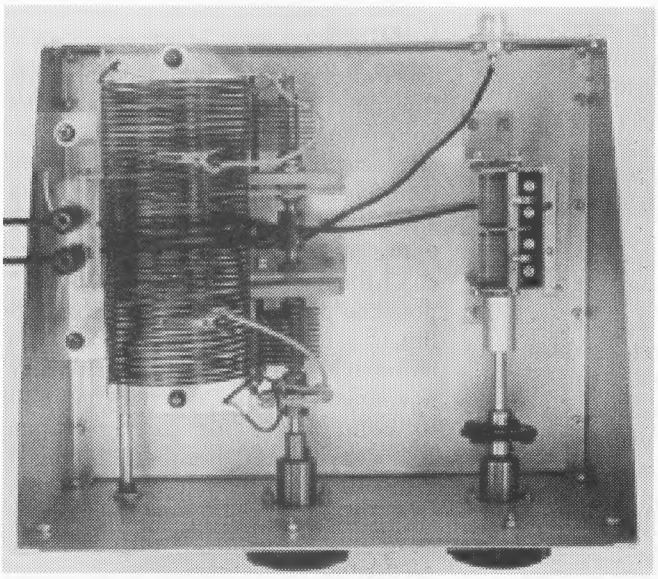

Photo 2: A "symmetrical "layout.

An improved circuit is shown in Fig 1C and Fig 2. Because capacitor C2 and C3 of Fig 1B are effectively in series, capacitor C3a and b may be moved to the electrical centre of coil L2, which now allows the rotors of C2a and b to be more conveniently connected (or the shafts of two identical capacitors may be physically and electrically joined). Thus, the need for (perhaps) fiddly close-spaced line taps has been eliminated. Interestingly, it is found that this configuration also removes the need for a swinging link; a fixed three-turn link will cover all HF bands. Note that the centre of C2a and b is not grounded.

Our circuit may be re-drawn as in Fig 1D, showing that we now effectively have a balanced pi-coupler arrangement, which offers improved harmonic rejection. Capacitor C3, being an ordinary broadcast capacitor with fairly close-spaced plates, also forms a convenient spark-gap for the discharge of any static electricity build-up on the antenna.

Construction

The home-made aluminium chassis in Photo 1 measures 280 x 230 x 150 mm WDH. To maintain good electrical balance, the physical arrangement of the coil and capacitors C3 and C2 must be symmetrical. A suggested layout is shown in Photo 2. C3 is just visible under the coil. Photo 3 shows the coil in greater detail, where C3 is partly visible.

Details of coil L2 are shown in Fig 3. Imperial dimensions are easier when marking out the rack upon the perspex former. A suggested method making high-Q coils (this one has a measured Q of 252) was described in Ref. 11. The 170 x 65 mm rectangle of 3 mm perspex for the coil assembly is supported upon two nylon (or similar) rods measuring 105 mm long, 12 mm dia. Photo 4 shows how the winding is cut in the centre, and a small rectangle of perspex, with suitably sized holes, is slipped over the coil wires (which connect to C3a and b) and cemented for mechanical support. The six coil taps may be of shim brass; remove the wire enamel, then fold a little tag of brass, about 6 mm x 20 mm around the wire to make a flag, clamp to wire shape with pliers, hold in place with an alligator clip, then solder.

Alligator clip "flying" connections for the coil taps should be made with stranded insulated electrical wire. Link coil L1 is three turns of insulated single-strand electrical wire. A few twists in the wire near the coil will hold L1 securely upon the centre of L2.

Capacitor C2 rotor shafts (or frame) must be insulated from chassis. The two 200 pF Eddystone units of the prototype are mounted upon perspex rectangles, which in turn are fitted to a U-shaped aluminium bracket for attachment to the chassis. The shafts are joined by a solid coupler, with an insulated coupler connecting the dial drive. C2 must have fairly wide-spaced plates, at least 15 thou/ 0.4 mm, which does not flash over on bands between 3.5 and 28 MHz at power levels up to about 120 W CW. No firm figures for power handling can be stated here because of the many variables in feed-line impedance. However, from 3.5 to 29.7 MHz, a similar pair of capacitors, or a 200 + 200 pF split-stator with similar or greater plate spacing should do. Capacitors C1 and C3 may be ordinary 2-gang broadcast types.

The knobs on the shafts of C2 ("Tune") and C1 ("Link") may be directly coupled, or preferably, have vernier dials as shown. C3 ("Match") is broader in adjustment, and less in need of a reduction drive.

For connection of the antenna feedline, a pair of binding post terminals may be fitted to a rectangle of perspex which in turn is mounted upon a pair of nylon posts in a similar manner to that for the coil.

Antenna and feed-line

All of the standard radio handbooks give details of open-wire feed antennae. Some radiator and feed-line lengths will perhaps give an easier match on particular bands. However, in my experience, just about any convenient radiator and feed-line length will be "match-able". If a system refuses to comply on a certain band, the addition (or subtraction) of perhaps 1 m of line (or antenna – same each end) should allow a match to occur.

The best line is probably home-made from electrical earth wire (or similar, with or without insulation), with a perspex spreader about every 1 m. Hold in place with a copper tie-wire through small holes drilled in the spreader. Line spacing is not critical. In my experience, this line is the least affected by rain and moisture, and that only to a very small degree, not usually requiring the coupler to be re-adjusted after rain.

Black or brown 450 ohm ladder line comes next. The earlier line used hard-drawn copper, but new line is of copper-clad steel, which makes it a bit awkward to handle. However, it can be routed past window frames and so on. Hint; with scissors or knife, remove alternate webs, which renders the line less affected by moisture. It should be taken down and washed yearly (dust traps moisture making the line more susceptible).

Low-loss "dog-bone" or "dumb-bell" TV type is very good line if available. No longer manufactured, but turns up at hamfests etc. Also needs yearly washing.

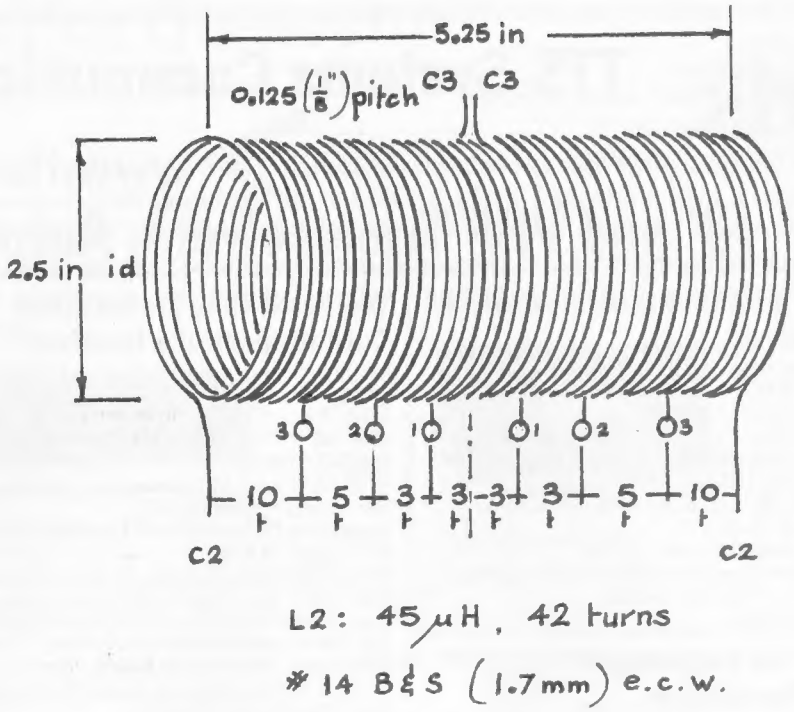

Figure 3

Ordinary 300 ohm slotted TV line is the least suitable line (most lossy), but quite good in an emergency, or for short runs inside a building or in awkward applications. Significantly affected by moisture.

Operation

Connect your radio to the coax connector of the coupler using a convenient length of 50 ohm coax cable-SWR meter-cable. Tap settings rather depend on individual antenna configurations. As a rough guide

Continued on page 10

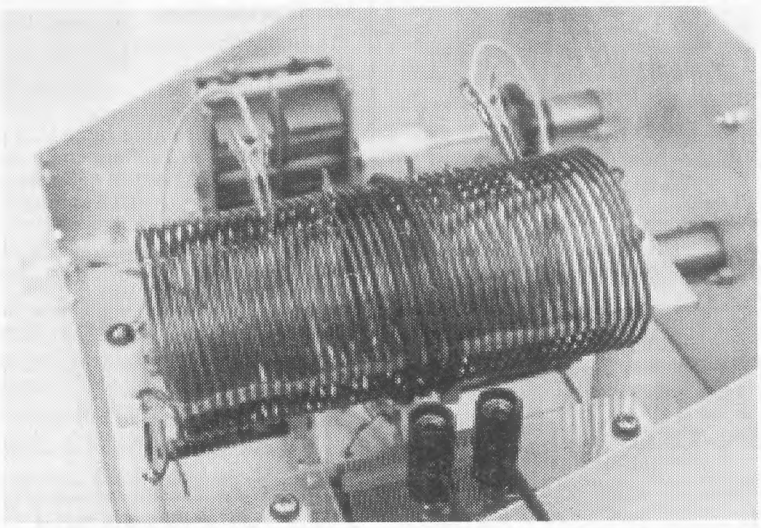

Photo 3: Coil detail.

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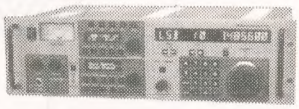

Modes AM, SAM, LSB, USB, ISB, CW, FM
Tunes 5 KHz to 30 MHz. +/- 1 ppm frequency stability.
User programmable AGC
Selectivity 57 bandwidths selectable from 0.1 KHz to 16 KHz.
Meter Calibrated in both dBm and S Units
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The Jupiter is essentially the Pegasus with a user panel. All of the Pegasus features plus a large LCD panel and controls. The Jupiter can be used directly under PC control in Pegasus emulation Mode. The GUI software is available at no charge. The command set for control of both the Pegasus and Jupiter is available allowing you to write your own control software.

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Morse Code Practice Generator

Alan Gibbs VK6PG
223 Crimea Street, NORANDA WA 6062
Email: vk6pg@tpg.com.au

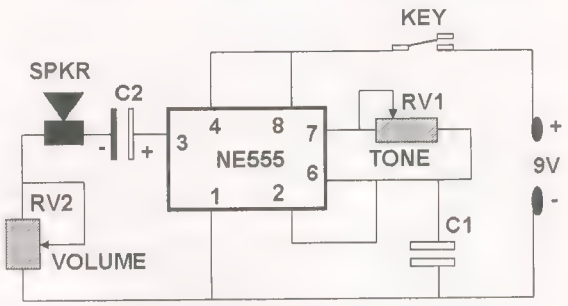
Every Radio Amateur will find this little gem very worthwhile. From the aspiring newcomer struggling to learn the Morse Code to the seasoned operator who kindly donates time to helping others pass the Amateur Radio Morse Code Examinations. Indeed, it is the perfect "first time" constructional project for clubs, schools and individuals, a fine introduction to electronic components, constructional techniques and soldering skills. Every club should have this project on the shelf as "ready-to-go" kits to help introduce newcomers to our wonderful hobby, and promote the use of Morse Code.

For this little project you will need:

IC, NE555	DSE Z6145	99c
C1, 0.1u	DSE R2360	10c
C2, 10u	DSE R4315	20c
R1, 4K7	DSE R1090	4c
RV1, 50k	DSE R1775	30c
RV2, 2k0	DSE R1769	30c
Strip Board	DSE H5614	$2:80
Mini Speaker	DSE C2208	$2:88
9v Battery plug	DSE S6100	$1:12
Zippy Box	DSE H2853	$4:96
Total New Cost =		$13:69

A fresh 9-volt Transistor Battery.
Optional Key Terminals, Crocodile Clips, or a 6mm mono Jack Socket and a few short lengths of hookup wire.

There is no need for an ON/OFF Switch because the key connection does the job for you. The project is constructed on a small section of perforated printed circuit board trimmed to fit tightly inside the box. Small 4mm holes are placed on the underside of the box to allow screwdriver adjustment of the two preset variable resistors, RV1 (Tone) and RV2 (Volume). On the aluminium faceplate, drill a small circle of 3mm holes to allow the sound from the speaker to be clearly heard when the key is closed. Adjust RV1 and RV2 to your personal liking - then to complete the project, fill the spare space inside the box with "bubble wrap" to hold the speaker, battery and printed board in place so everything doesn't rattle when shaken by hand. Construction time should take about one hour including drilling the speaker holes in the faceplate. No doubt, most of the components can be found in the Shack Junk Box, but if all components are bought new – the total cost will be less than $15:00. However, the outlay will be recouped in just one Morse Lesson or when used to find a wiring fault in your garden trailer etc.



MORSE CODE PRACTICE GENERATOR
VK6PG

The circuit is attributed to Jim Burney, WA5YFL and published in the July 1974 edition of the ARRL Journal *QST Magazine*, and has been in use by the writer for over 25 years without failure. The output volume is more than enough to fill a very large room with an audience of 20 people and the perfect low-cost solution when running Morse Code classes. Other applications include: A Continuity Tester, Door Bell, Vehicle Reverse Indicator, QRP Transmitter Sidetone Generator, Security Mat Alarm, Remote Alarm for the garden Shack, Battery Tester and many more.

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WIA Comment *continued*

Conclusion

The Federal WIA meeting held at Paramatta was a significant step in the preparation of the WIA response to the ACA discussion paper. There remains consider work to be conducted in attending the ACA public meetings and in discussions that need to be held with the whole amateur radio community. I do however believe that there is a general consensus on a way forward at this time. I note with interest the similarity between the Federal WIA proposals for an Entry level licence and those being discussed in other forums. The best hope for the future of the hobby is to get as many people behind a common position and then present this position to the ACA. As further developments occur I will keep you informed about them.

As always I look forward to hearing your views on the these matters. All the best in amateur radio and 73s de Ernest Hocking VK1LK

Ernie Hocking VK1LK

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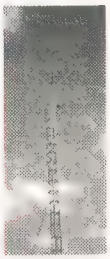

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Continued from page 7

however, on 3.5 MHz the full inductance of L2 will probably be required, so clip C2 to the ends of L2. On 7 and 10.1 MHz, clip to taps 3-3, 14 and 18 MHz try taps 2-2. 21 through 28 MHz will probably need taps 1-1.

Experiment with all four variables for maximum received band noise/signals, until you feel the coupler is near peak adjustment. Now, on a clear frequency, apply the smallest tuning signal that your SWR meter will properly respond to (say 10 W). Again carefully adjust C1, 2 and 3 for best SWR (do not touch the coil when transmitting). If it cannot be made less than about 1.1, switch off and try a new pair of taps. When a satisfactory match is obtained, log the settings for that band on a suitable look-up table. Do the same for every band of interest.

A pair of RF thermocouple ammeters, about 2 or 3 A f.s.d. (for 120 W) is the most ideal line current indicator (for balance and comparison- perhaps with other couplers). But these are now rare items, so if you are not the fortunate owner of a pair of meters, consider making a twin-lamp current indicator as described in Ref. 12.

For single-wire feed type antennas, a good earth ground must be connected to the coupler chassis. Adjustment is similar to that described for the balanced feeder. A neon lamp, placed near the line will glow for voltage feed, and a lamp current indicator (Ref. 12) will glow for current feed. Disconnect the feed-line from the coupler when not in use.

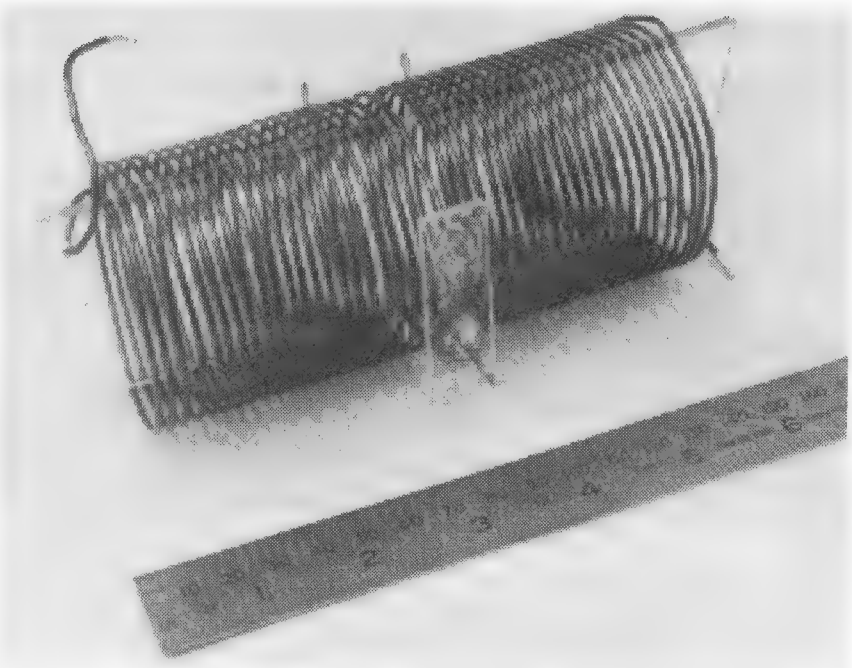

Photo 4: Coil assembly.

Summary

In order to operate a wire dipole or loop over several or all HF bands, we need some kind of coupler. The benefits of low radiation from, and pick-up into the feed-line of a balanced doublet or loop may be lost if the coupler is not also precisely balanced. However, most patterns of popular and/or convenient "ATUs" are inherently unbalanced, and therefore do not properly address this task. Nor are they always efficient when used to match into difficult loads.

Amateurs everywhere have been re-discovering the suitability of some truly balanced coupler circuits used by earlier radio workers to match transmitters into open-wire fed antennae. Drawing largely on this material, described here is a practicable improved model, constructed from procurable parts, for use with open-wire and single-wire fed antennae.

References and Further Reading:

1 . "Using Open-Wire Feeder"; In Practice, I. White, G3SEK, RadCom Aug. '00.

2. "A Balanced, Everyday Approach to All-Band Bliss"; K. Kleinschmidt, KT0Z, QST Apr. '02.

3. "Balanced Line ASTU and Current Indicator"; Garrott, G0LMJ, RadCom July/Aug '98 (Reproduced in Backyard Antennas; by P. Dodd, G3LDO- RSGB Publications, p54).

4. "ATU Power Ratings"; In Practice, I. White, G3SEK, RadCom June '97.

5. "A Balanced-Balanced Antenna Tuner"; R. Measures, AG6K, QST Feb. '90.

6. "ATUs for Balanced Tuned Lines; Technical Topics, P. Hawker, G3VA, RadCom Aug. '99.

7. "Balanced-Fed Large Loop Antennas"; Technical Topics, P. Hawker, G3VA, RadCom, Sep. '02

8. "Wide-Range Coupler for Any Antenna"; ARRL H'book, 42nd (1965) edition, p354.

9. "Coupling the Transmitter to the Line"; ARRL H'book, 32nd (1955) edition, p313.

10. "A Swinging Link Antenna Coupler"; Diamond, AR July '00.

11. "Making Air-Wound Transmitting Coils"; Diamond, AR June '00. (copies available from the writer).

12. "A Current Indicator for Open-Wire Transmission Lines"; Diamond, AR Jan. '99.

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PLAN AHEAD

VHF-UHF Spring Field Day

1st 2nd November

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Ross Hull VHF Contest

December/January

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to reply to the

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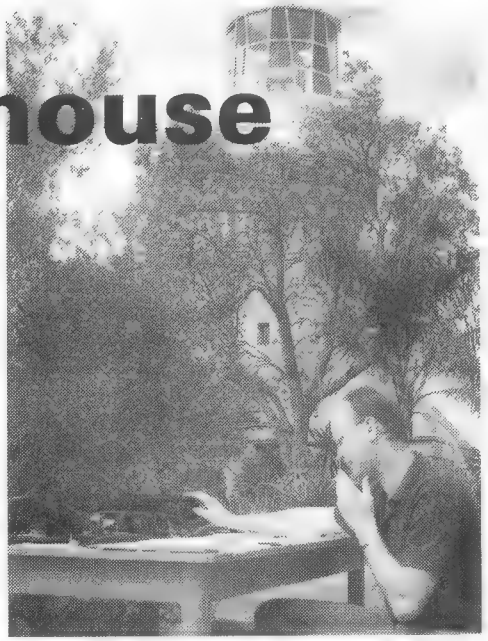
DISCUSSION PAPER

A Weekend at Barrenjoey Lighthouse

Richard Murnane VK2SKY
Publicity Officer for MWRS
PO Box 1247, North Sydney NSW 2059
rmurnane.1@optusnet.com.au

This year, the Manly-Warringah Radio Society activated Barrenjoey Lighthouse for the first time.



Peter VK2IT at the mic. More pictures of the Manly-Warringah Radio Society Lighthouse Weekend on inside back cover

Barrenjoey Lighthouse at Palm Beach in Sydney had been closed to the public following a legal battle that ended in 1998. This year, however, the National Parks and Wildlife Service (NPWS)re-opened the lighthouse to mark International Lighthouse Day on Sunday 17th August.

Meanwhile, the Amateur Radio Lighthouse Society had been running the International Lighthouse and Lightship Weekends for a number of years; each year the event occurs on the third weekend of August, when Amateurs around the world set up shop at a lighthouse or lightship. This year, some 360 stations in about 40 countries (including VK2, VK3, VK4, and VK6) planned to take part.

With Barrenjoey Lighthouse being open to the public, it was too good an opportunity for the Manly-Warringah Radio Society to pass up! It was also a good excuse to enter the club station in the Remembrance Day contest on the same weekend.

In the preceding weeks the club was a flurry of activity, organising the establishment of a portable station on Barrenjoey headland. The site is inaccessible by road, being about 800 metres from the nearest car park, and with a steep 113-metre climb up the headland. The NPWS typically delivered equipment by helicopter. We *did* have access to a helicopter that weekend, but using it to transport Amateur Radio gear was not an option!

Dom VK2JNA met with the local ranger and evaluated the limited facilities; we could set up near the lighthouse, but not inside. There was no mains power or water. Everything would have to be lightweight, and because we would be on battery power, QRP was the order of the day. We settled on Yaesu HF portables (two FT-897s and an FT-817), plus a couple of handie talkies. The antennas were a Spiderbeam portable tribander for 20, 15 and 10 metres, plus a 40-metre band wire dipole. The latter was christened the "Gordian Dipole", as it had managed to tangle itself into an almost impenetrable knot!

Finally, on that bright sunny winter morning, with rigs, antennas and masts, batteries, furniture, and provisions in hand, we set off down the beach toward the headland, and within half an hour we lay panting and gasping atop the hill, in the shadow of the lighthouse, ready to start the real work.

Bernd had promised we could be on air in about an hour, though it was nearer to three. The Gordian Dipole won us a few contacts on 40 while some of us struggled with the brand new Spiderbeam which had been only partially assembled once before by Bernd VK2IA and Dom VK2JNA. At times, the effort was reminiscent of that famous wartime image of the US marines at Iwo Jima, but we got there in the end, with a slight tilt to the east.

While we worked to knock the Spiderbeam into shape, curious passers-by asked us what we were doing with a few wags asking how we were going to get our washing up on our thirty-foot high Hills Hoist, was it a hang glider, etc. Quite a few seemed surprised to learn that Radio Amateurs still existed! Anyone even remotely interested was given one of the PR leaflets we had prepared, introducing the hobby and inviting the reader to the club. Some people had read the club's news release in the *Manly Daily*, the local newspaper.

The lighthouse itself received numerous visitors. At one point, people had to wait for up to an hour and a half to get inside. This was an excellent opportunity to talk to people about our club and our great hobby!

VK2MB/portable managed a modest total of about three hundred contacts, mainly due to the limited power of the batteries, and having to operate QRP to make them last! Already the club is discussing alternatives for next year's event. Still, all continents – except Antarctica – made it into the log, and perhaps most importantly, everyone had a great time.

Mainly lessons were learned from the exercise, which will contribute to making next year's Lighthouse and Lightship Weekend bigger and better than ever. Will the Manly-Warringah Radio Society be in it? Try to stop us!

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Web links:

Manly-Warringah Radio Society:
www.mwrs.org.au

Spider beam antenna
www.qsl.net/df4sa/index_spider.htm

Association of Lighthouse Keepers' International Lighthouse Day page
www.lighthouse.fsnet.co.uk/events/intlighthouseday.html

The Amateur Radio Lighthouse Society
http://arlhs.com
http://vk2ce.com/arlhs.htm

Official International Lighthouse & Lightship Weekend website
http://lighthouses.net.au/illw/

Barrenjoey Lighthouse info -
www.lighthouse.net.au/lights/NSW/Barrenjoey/Barrenjoey.htm

Gladesville Amateur Radio Club
http://welcome.to/TelevisionGladeville

A stepped range control for the 80 metre Foxhunt Sniffer

By Bryan Ackerly, VK3YNG.

Last month an 80 metre foxhunt receiver was presented. This article provides a refinement to the design that allows the attenuation level to be discretely stepped.

Why use stepped ranges?

The 80 metre sniffer shown last month used a simple variable potentiometer to provide all the attenuation required. While this is the simplest and cheapest way to provide gain control, there are more intuitive ways of doing so.

Most of the sniffing equipment now in use by active foxhunters indicates the amount of attenuation required in discrete steps of around 15 to 20dB per step. It is easier to refer to range numbers as a relative measure of distance than a setting on a potentiometer. A typical sniffer normally uses between 7 and 10 ranges and most modern sniffers on the two metre band insert the required attenuation automatically.

On two metres the receiving antenna is normally large compared to the wavelength involved. A large number of ranges are required to attenuate the signal as you get very close to the transmitter and couple more and more energy into the receiving antenna. Up to 130dB of attenuation can be required on this band. The need for extra attenuation occurs more and more rapidly as you get closer to the signal source, hence many of the more competitive foxhunters now use automatic ranging on this band.

On 80 metres however, the receiving antenna is quite small compared to the wavelength and a lot less ranges are normally needed as you get close to the transmitting antenna. Typically the attenuation required is about 30dB less than that required for two metres. Therefore since the need for range changes occurs less often on 80 metres a manual range control is usually quite adequate for use on this band.

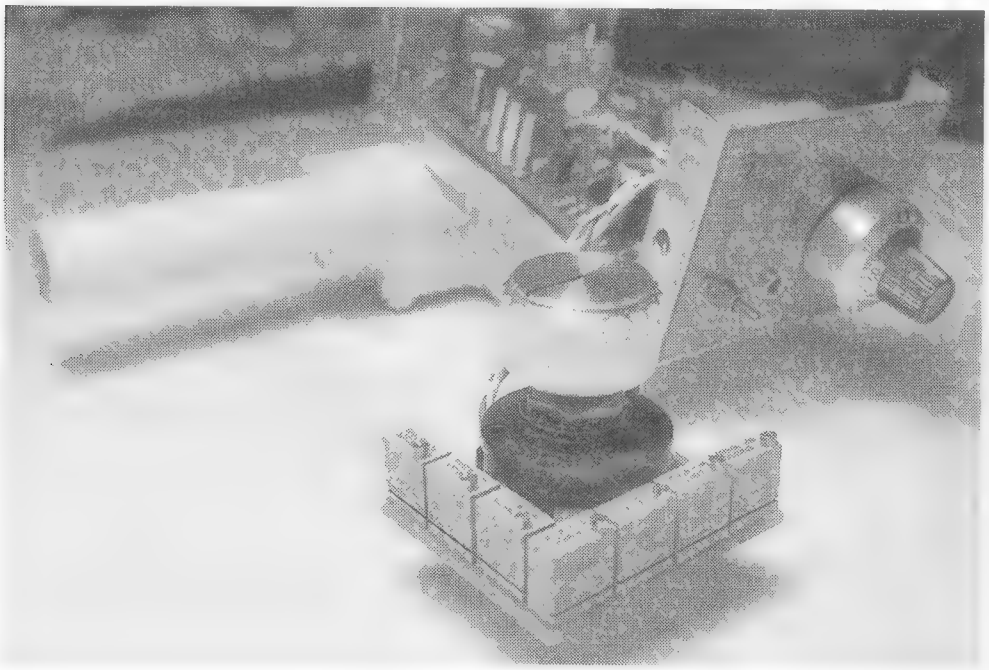

Photo - 80m sniffer stepped range control.

Circuit Operation:

This circuit basically replaces the attenuation control (RV5) on the 80m sniffer. R2 (or R1) provides full 5V supply to the gain control line when the range control (SW1) is set to the lowest two ranges. This sets the sniffer to maximum sensitivity.

For ranges 2 through 8, RV1 through RV7 load down the supply from R2 providing a number of preset voltage divisions. Ten turn trimpots are used, as the levels can be rather difficult to adjust with single turn pots, particularly on the higher ranges. Lower values of resistors for the last two ranges assist with setting these levels. Discrete resistors were not used due to the spread of gain versus

Apology

The Editor apologises to Bryan Ackerly VK3YNG for the omission of his name as author of the first part of this series published in September Amateur Radio on page 4. Further we apologise for any annoyance caused to Ian Stirling VK3MZ who could have been taken as the author of the article. VK5UE

voltage characteristics between sniffers. The multiturn pots are more expensive but result in a simpler solution.

When SW1 is set to the lowest range ("A"), current is drawn through R4 (or R3) which turns on Q1. The collector of Q1 provides 5 volts to the "Audio Switch" line on the sniffer. This effectively overrides the sniffer's tone switch and forces it into audio mode. For ranges 1 through 8, R6 (or R5) ensures that Q1 remains off and the sniffer returns to the mode selected by the mode (Tone/Audio) switch on the main board.

Construction

Construction is straightforward. There are no coils to wind or otherwise special components. There is one surface mount component. Mount Q1 as shown in figure 3. A good pair of tweezers and a small soldering iron is all that is needed to mount this device. The orientation is fairly obvious.

Next mount the fixed and variable resistors as shown in figure 2. If preferred, 0805 case surface mount resistors can be used instead of through hole parts. Note the orientation of the multi-turn trimpots.

Mount the rotary switch next. You may need to cut the shaft to a more suitable length. The top of the switch also contains a ring that determines the number of positions the switch has. Set the switch fully counter-clockwise and remove the ring. Set the tab of the ring into the "9" position.

Finally mount the wiring to connect the range control to the main board. This board replaces sniffer gain control RV5. A fourth wire connects to TP7 that is located immediately below U4 on the sniffer main board. A right angle header can optionally be used to allow the board to be removed if this is desired. If this is done, make sure the header, plug and cabling clear all components on the main board when the box is assembled.

The metalwork drawings for the sniffer assume the stepped range control will be used so there should be no need to drill any additional holes to fit this board.

Alignment

The easiest way to align the range control is with the assistance of an RF signal generator with a calibrated attenuator. Otherwise a 3.5MHz signal source with a low resistance pot (about

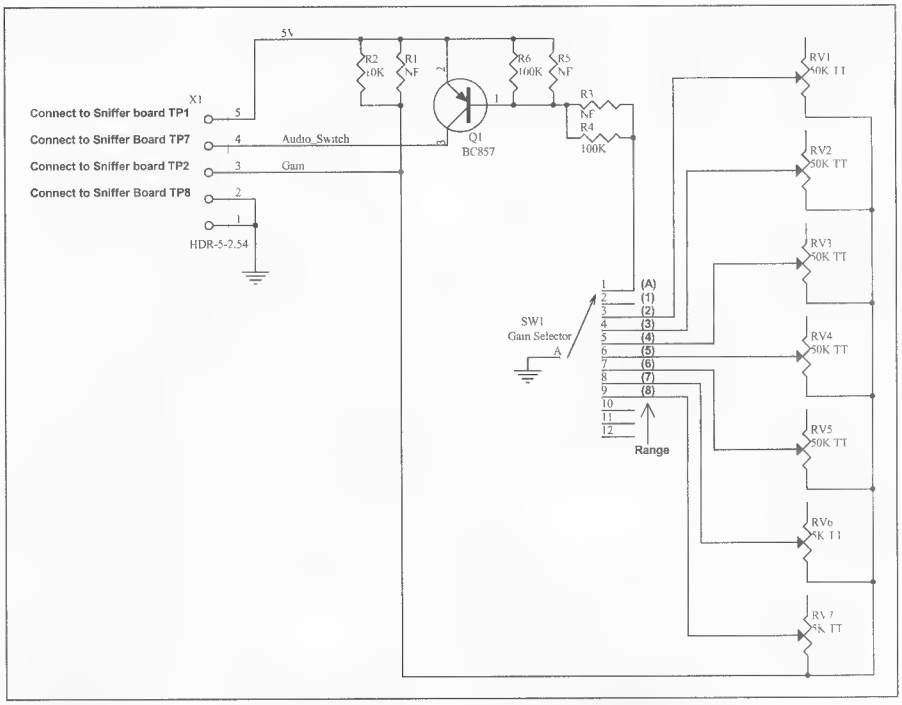

Fig 1 – 80m sniffer stepped range control.

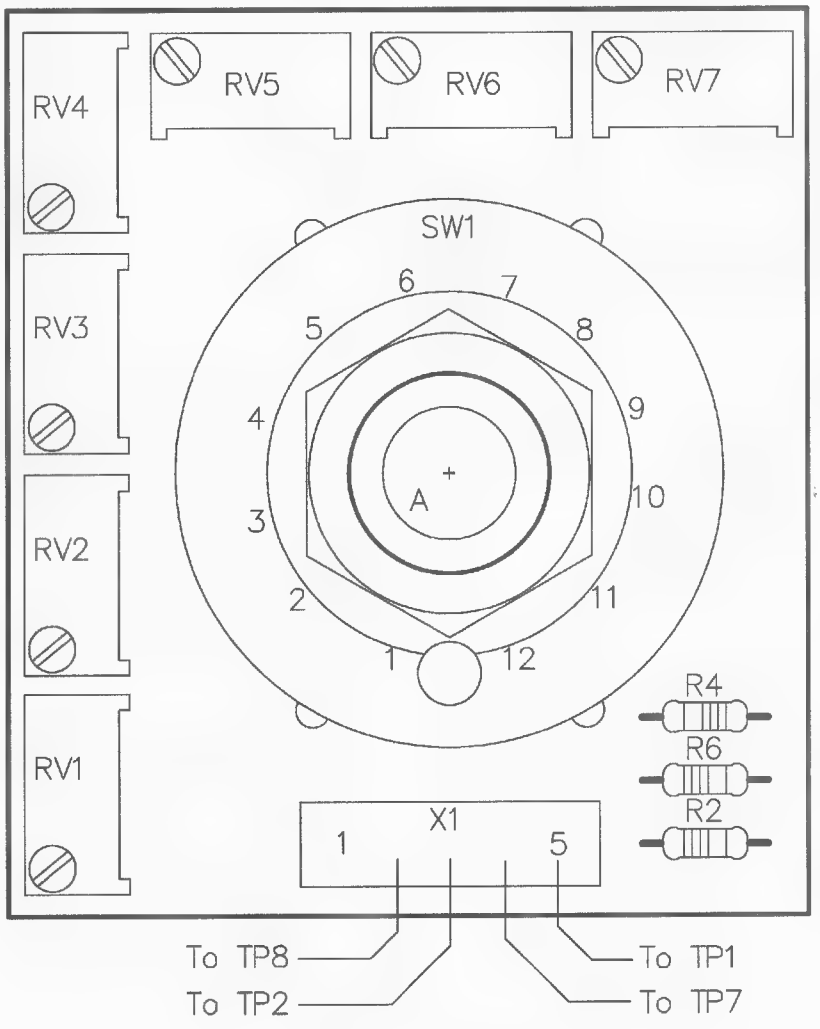

Fig 2 – PCB top assembly.

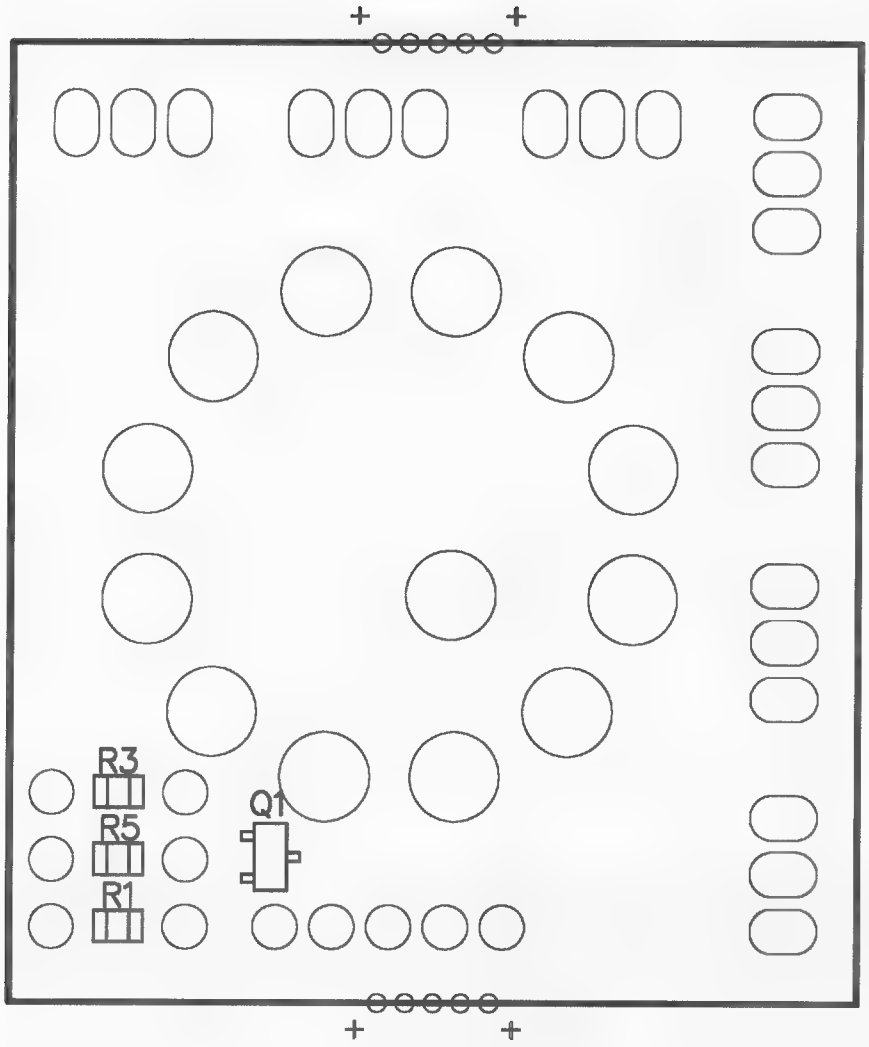

Fig 3 – PCB bottom assembly.

1k to 5kohm) configured as a voltage divider may do.

Connect the signal generator to the antenna port of the sniffer and set it to 3.58MHz with a signal level of about –115dBm. Switch the sniffer to the "Tone" position. Select "A" on the range control and tune the sniffer to ensure the signal is tuned "mid band". Select range 1 and ensure the sniffer reverts to Tone mode. Take note of the pitch of the tone. Set the sniffer to range 2 and increase the level of the signal generator by 15dB. Adjust RV1 until the same tone pitch is heard as on range 1 with –115dBm. Switch the sniffer to range 3 and adjust RV2 for the same tone pitch again. Continue this for RV3 through RV7 until all ranges have been aligned.

The exact signal level is not that important as the main idea is to make sure that there is some overlap between the ranges. The job is just made a bit easier with a proper signal generator, but it is by no means compulsory.

Use the signal generator to step by 1dB steps and verify check that the ranges provide a reasonable amount of overlap. The sniffer should be able to handle levels up to about 0dBm. This should be adequate for normal ARDF foxhunting and should allow you to take bearings right up to the transmitter antenna.

Operation

The range control is set up to effectively allow one-handed operation on an ARDF foxhunt without the need to fiddle with any extra switches. The tone mode does not normally function when signals are very weak. In this case, setting the sniffer to the "A" position will switch the receiver to the Audio (LSB) mode without the need for changing the mode switch. This allows very weak signals to be tuned and rough bearings can be determined. For this to work the mode switch should normally be left in the "Tone" position.

As the signal gets stronger the range control is stepped up through the ranges from 1 through 8. Tone mode is automatically selected when any of the numbered ranges are used. If Audio mode is ever required with attenuation, setting the mode switch to "Audio" will force the sniffer range control to function in audio mode only.

With a bit of practice you will be able to get a good idea of the distance to the transmitter for each range. You will find this much easier and more intuitive than trying to use a continuously variable range control, especially if you are used to hunting on 2 metres with an auto-ranging sniffer.

Continued next page

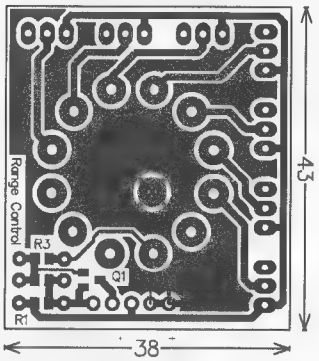

Fig 4 – PCB artwork.

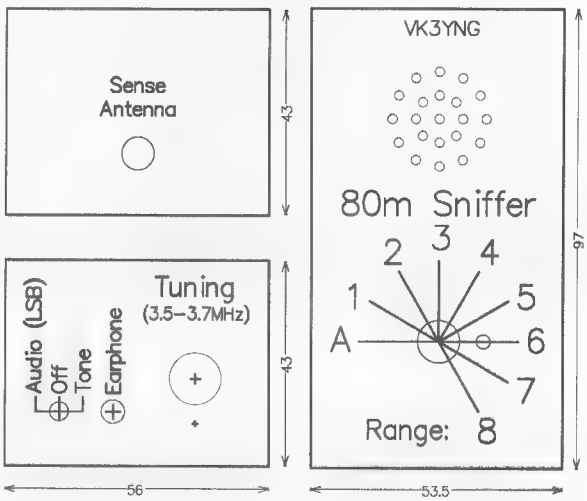

Fig 5 – Front and side panel artwork.

Davpil@midcoast.com.au

Political involvement

Last month QNEWS had an interesting story sent by Jose Jacob, VU2JOS, about how Amateur Radio is promoted in India. The story is quite large and was written by Radhika Sachdev and published in the Hindustan Times newspaper.

It speaks of the world's most fun loving, scientific club of three million licensed 'HAM' operators, of our around 40 earth satellites and of Earth-Moon-Earth (EME) links. The current boom in digital technologies has only fired their appetite more says the article. In India, primarily due to the personal initiative of the late Prime Minister Rajiv Gandhi (then an MP and a licensed HAM operator) who persuaded the government to set aside monies to establish a National Institute of Amateur Radio (NIAR) in Hyderabad. Today, although very few are aware of this, MPs get a special budget to establish HAM clubs in schools as a portion of their constituency development funds. For instance, they mention many nets such as a HAM doctor's association that meets every morning at 7 at 14.150 MHz to swap information on the latest medical breakthroughs; then there's an NRI Club, the Charminar Net (for south Indian buddies) all legitimate platforms to exchange greetings with friends and families. It is an excellent article, a real insight into AR not only in India but the world.

(QNEWS 0810)

South Africa elects a new President

At the Council meeting held by teleconference on Tuesday evening 5 August 2003, Graham Hartlett ZS6GJH was unanimously elected President of the SARL. Graham takes over from Hans Potgieter ZS6ALJ who resigned at the end of July. Peter Hers ZS6PHD was elected as the new Vice President of the SARL.

(sarl)

Netherlands new prefixes

New prefixes are in effect in the Netherlands. On the HF bands, PA, PB, PC, PF, PG and PI callsigns can be heard with one, two or three letter suffixes, while on VHF and above, PD, PE and PH are the prefixes, again with one, two or three letter suffixes. For example, Peter, formerly PB0AIU, who sent the RSGB this news story, is now PC2A.

BPL problem now a movie

The ARRL has produced a short movie that documents just how bad the problem of Broadband over Powerlines can be. Bill Pasternak, WA6ITF from the Amateur Radio Newsline has the rest of the story. "BPL is the most crucial issue facing Amateur Radio and the one that has the most devastating potential." The words of ARRL President Jim Haynie, W5JBP. And Haynie is not far from wrong. If you have any doubts that this is one of the biggest challenges yet to the survival of ham radio, simply take your web browser to the ARRL website and click on the link to the on-line movie. Then watch and listen for yourself. To again quote ARRL President Jim Haynie, in terms of interference potential on HF and low VHF frequencies, nothing is on the same scale as BPL.

(QNEWS 2308)

Hams injured in Baghdad blast

The Daily DX http://www.dailydx.com reported that three Amateur Radio operators were injured in the August 19 bombing of the UN Headquarters at the former Canal Hotel in Baghdad, Iraq.

It is understood that Ghis Penny, ON5NT, was at the UN Headquarters when the bomb went off. He reportedly suffered a minor head injury and was evacuated August 21 to Amman, Jordan.

Robert Kasca, S53R, was also working at the UN offices when the explosion occurred but apparently was not hurt. It is understood that he plans to continue working in Iraq. It was also reported that Michael Dirksen, PA5M (ex-PA5MD) was hospitalized in Germany as a result of the bombing and was said to be doing well.

(ARRL N/L 2208)

Br

A stepped range control for the 80 metre Foxhunt Sniffer *continued*

Parts List

R2 - 10k, 1/8W or 1/4W axial resistor
R4, R6 - 100k, 1/8W or 1/4W axial resistor
RV1, RV2, RV3, RV4, RV5 - 50k Bourns 3296W PCB mount multiturn vertical trimpot or equivalent (Jaycar RT-4654)
RV6, RV7- 5k Bourns 3296W PCB mount multiturn vertical trimpot or equivalent (Jaycar RT-4648)
Q1 - BC857, SOT-23 SMD PNP transistor (Farnell 300-0709)
SW1 – Lorlin 12-way PCB mount rotary switch (Jaycar SR-1210)
X1 - 5 pin 2.54mm right angle header (optional)
R1, R3, R5 – Not fitted 0805 SMD resistor (optional, replaces R2, R4 and R6)

For more information:

The Victorian ARDF group web page: http://www.ardf.org.au
Joe Moell's (USA) foxhunting web page: http://www.homingin.com
The Author's web page: http://www.users.bigpond.net.au/vk3yng/foxhunt
The Author's email address: backerly@bigpond.net.au

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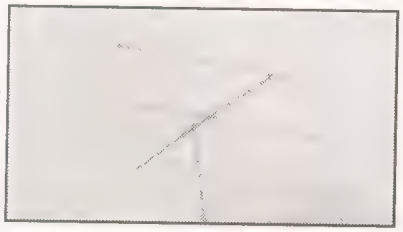

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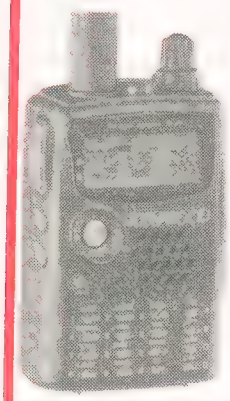
222 MHz Band (U.S. version)
True Dual Receive: V-V/U-U/V-U/GEN-HAM
Power Output: 5 Watts 222 MHz: 300 mW) 6 m AM: 1 W

• AM Shortwave and Broadcast RX • Weather Functions • Over 500 Memory Channels • Shortwave & Marine Band Memory Bank • Rugged Magnesium Case Submersible: 30 minutes @ 1 metre • Rubber Case • Protection Bumpers 1300 mAh Lithium-Ion Battery Supplied • CTCSS and DCS Encoder/ Decoder Circuits Built In; Split Tone mode available • ARTS™ Auto-Range Transponder System • Internet Key for Access to WIRES™ Repeater-Internet Linking System Dazzling 132 x 32 Dot Matrix Display • Full Color Strobe LED , Color Editing 24 Hour Clock andTimers • Audio Wave Meter • Spectrum Scope Display • RX and TX Battery Savers & Illumination Control • "Quick-Draw" Swivel-Mount Belt Clip • Emergency Strobe/Beep Feature • 16-Digit, 9-Memory DTMF Autodialer • Automatic Repeater Shift (ARS Cloning Capability to other VX-7Rs

TH-F7E Kenwood

Amateur VHF/UHF Transceiver

Freq: TX: 144-146 /430-440 MHz
RX: 0.1-1300 MHz
Mode:
TX: FM
RX: AM/FM/SSB/CW
RF Power output:
Hi: 5/5 W
Lo: 0.5/0.5 W EI: 50/50 mW
Voltage: Internal: 5-7.5 VDC External: 12-16
Weight: 250 gr (with lithium-ion battery pack)



IC-208 Icom

IC-208 Amateur VHF/ UHF Transceiver

Freq: TX: 144-146 / 430-440 MHz
RX: 118-1000 MHz
Mode: TX: FM RX: AM/FM
RF Power output:
Hi: 50 / 50 W, Mid: 15 / 15 W, Low: 5 / 5 W
Voltage: 13.8 VDC **Weight:** 1.2 Kg

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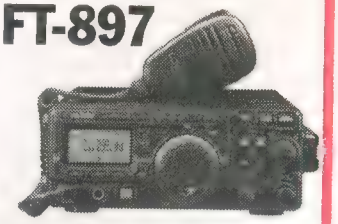
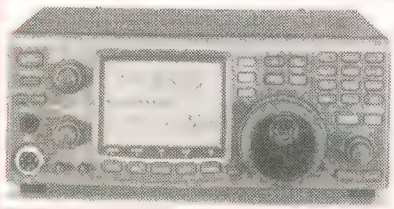


Frequency Coverage: RX: 100 kHz-56 MHz, 76 MHz-108 MHz (WFM only) 118 MHz-164 MHz 420-470 MHz **TX:** 160 - 6 m, 2m, 70 cm Amateur Bands; SSB/CW/AM/FM/FM-W/Digital Modes
100 Watts Power Output (HF/6 m); 50 W (2 m); 20 W (70 cm)
Optional Internal Batteries: 4800 mAh x 2 (Power Output: 20 W)
Built-in — Digital Signal Processing — 3-Message Memory Keyer— VOX —AF Speech Processor.

• Automatic Beacon for Expedition Use • IF Shift • IF Noise Blanker • Spectrum Scope Clarifier ("R.I.T.") • AM and FM Broadcast Reception • AM Aircraft Reception • Transverter Interface Jack • AGC Fast/ Slow/Auto/Off Selection • 200 Memories plus HOME and Band- Limit Memories • Alpha-Numeric Memories • Multi-Color Display • Compatible with ATAS-Series Auto-Tune Antennas • Built-in CTCSS and DCS Encoder/Decoders • ARTS™ Auto-Range Transponder • Smart Search™ Automatic Memory Loading System • CW Training • Computer Interface • Cloning Capability • Strong Carrying Handle

IC-910H Icom Amateur VHF/UHF Transceiver



Freq: 144-148 / 430-440 MHz 1240-1300MHz
Mode: FM/FM-N/SSB/CW
RF Power output: 5-100 / 5-75 W
Volt: 13.8 VDC **Imp:** 50 ohms, SO-239 / N
Dimensions (W*H*D): 241*94*239 mm

TM-D700A

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GippsTech 2003:

Australia's premier technical conference?

By Jim Linton VK3PC

The program and events that were part of this year's GippsTech undoubtedly enhanced its reputation as the premier technical amateur radio conference in Australia concerning VHF, UHF and microwave bands.

The conference is held by the WIA Eastern Zone Amateur Radio Club at Churchill about 170km east of Melbourne on the first full weekend in July. It includes a conference dinner and a partner's bus tour of local attractions plus shopping spots.

A total of 14 presenters delivered papers on an interesting range of topics including the use of the weak signal software WJST, several on different aspects of propagation, portable and mobile operating, DXpeditioning, and contesting.

The finer details of all presentations can be read in the published proceedings. For more information visit the WIA EZARC website http://www.qsl.net/vk3bez/

Outside the lecture theatre there was a very busy display area and sales tables. The VK5 Equipment Supply Committee were on hand and sold their wares.

The keynote speaker Joe Taylor K1JT gave an hour-long presentation entitled "WSJT, Present and Future". This had been eagerly received by all, particularly the one third present who had already used the WSJT software.

With the use of computer display projection and spectrograms, he demonstrated the four modes:

- FSK441 that uses the scatter from the ionised trails of random meteors to achieve contact distances of 600 to 2,200 km. Those signals typically last only tenths of a second, requiring an extremely high transmission rate and very narrow bandwidths.
- JT44, ideal for contacts over extended distances under most steady propagation conditions. Designed with EME in mind, the software allows extremely weak signals to be added together over successive periods, producing an "averaged" result of decipherable text when each individual 30-second transmission period yields few if any decodable characters. The mode is also useful on long tropospheric paths.
- JT6M is designed for 6-metre band ionoscatter and meteor scatter. This mode can work with signals that are up to 13 dB weaker than those required for FSK441.
- EME Echo – a tool for stations to test their system performance by receiving reflections or echoes of their own signals off the moon.

The VK3KAI rover vehicle in Summer Field Day 2003.

It includes a vertical dual band whip 2/70, vertical Whip for 6 m, 15 m and 40 m, an Alford Slot for 23 cm, Big Wheel for 2 m, Stack of 2 Big Wheels for 70 cm, Offset fed Dish for 10 GHz, and not mounted - offset dish for 2.4 to 5.7 GHz. Can be operational on any band within minutes of stopping at a site!

The WSJT software provides a unique tone or sequence for each letter, figure or character, fixed keying speed, narrow bandwidth, and digital filtering. The coding for each mode is different, based on the requirements for the type of propagation and resulting signal characteristics.

Joe K1JT explained that on average there are 12.7 dits per character in Morse code and all of them have to be received. That results in a loss of up to 11 dB in gain.

Compare this to FSK441 that uses four tones that enable 64 different combinations of tone sequences, and the equivalent of three dits per character. The result is a transmission rate of 147 characters per second, or just under 9,000 letters per minute.

Demonstrated was the software's "birdie zapping" facility that eliminates birdies (unwanted signals) to improve signal copy with only a slight reduction in sensitivity level.

The presentation included discussion on the theoretical limits of the existing WSJT modes. In the United States there is experimentation at 10.3 GHz by two radio amateurs using "Ice-scatter" which is refraction off clouds that contain ice particles.

WSJT was certainly a main theme of the conference. Ron Cook VK3AFW gave two related presentations - one on a better interface between the radio and computer for WSJT, and the use of JT44

as a tool for propagation studies.

Guy Fletcher VK2KU spoke about procedures in Australia for terrestrial use of JT44, while Jim Collins VK3ZYC gave details of the experimental use of WSJT through the VK3RGI 144.434 MHz beacon over the weekend prior to the conference.

Operating temporarily as a weak signal mode beacon for almost two days (46.5 hours) it was logged by 17 stations at distances of up to 605 km in VK2, VK3 and VK7.

With the confirmation that K1JT would be attending the conference, the GippsTech organising committee decided to promote the emerging WSJT theme through a propagation test.

With the approval of the ACA, the WIA Eastern Zone Amateur Radio Club changed the transmission mode of the Gippsland 2 m beacon to JT44 over the weekend prior to the conference.

The beacon transmitted in the first 30 seconds of each minute and "listened" in the second 30-second period.

The computer saved the received audio to hard disk and kept a record of any decoded text. Following the test period, the files were examined to determine which stations had been successful in having their report of the beacon logged by the beacon itself.

At the conference, two prizes were awarded to the most distant stations. No complete reports were submitted for reception only at distances greater than the two most distant stations achieving 2-way exchanges with the beacon – Guy Fletcher VK2KU at 605km and Rex Moncur VK7MO.

Propagation from all angles

A lifetime of investigating radio propagation was the background to an enlightening presentation by Andrew Martin VK3KAQ who spoke on the nature and characteristics of VHF propagation ducts.

While employed at the Telstra Research Laboratories in the 1970s he realised that knowledge of the propagation of radio waves was limited.

In the 1980s he set up his own company, Martin Communications Pty Ltd, and is in high demand in optimising fixed microwave links. In 1999 he received the Clunies Ross National Science and Technology Award.

During his GippsTech presentation, Andrew VK3KAQ explained his findings from the use of a SODAR, or sonic radar, used to measure atmospheric density fluctuations as a function of height up to about 800 metre.

Based on observations made to date at a site near Melbourne, he said elevated ducts in the troposphere usable for radio occur at about 600 metre, and in fact they form and dissipate at that elevation, rather than as some believe change their height above earth.

As far as he can determine, these ducts appear as far south as Mt Gambier and to Townsville in the north. The main duct appears at the 30th parallel running east to west. They dissipate during daytime.

Other ducts are formed along coastline due to temperature inversions created by a convergence of sea and land air masses.

Andrew VK3KAQ said, "A duct acts like a bandpass filter, varying due to its thickness." The changes in its density are correlated with the ability or efficiency of a duct to be useable for some frequency bands at a particular time and not others.

He described why tropospheric propagation can be available say on 2-metre, while not on 70 cm, 1.2 GHz or higher, but as the density of the duct varies so does the optimum usable frequency.

The point at which a signal enters a duct can be important, and a station located higher than the duct is likely to be refracted out of the duct.

There were two other speakers on propagation. Brian Tideman VK3BCZ talked about the mysteries of sporadic E-layer ionisation.

This propagation mechanism has been known to exist since the 1950s, yet it still cannot be accurately predicted. Those interested in this topic are advised to read the paper by Brian VK3BCZ.

In a related topic, Jim Collins VK3ZYC talked about access via the Internet to a useful aid to propagation. The Bureau of Meteorology has some 50 radars that are primarily used for tracking rainfall.

They are also indicators of anomalous propagation, or what is known as the "phantom rain effect". These appear on radar displays just like rain, but where obviously due to weather conditions no rain is falling.

Jim VK3ZYC showed examples of these displays, which are a good indication of enhanced propagation. The radar displays can be viewed by logging into www.weatherzone.com.au

Go hopping and score well

The world of "rover" operation, or grid square hopping during VHF/UHF Field Day contests, was demonstrated by Peter Freeman VK3KAI, who has been a rover.

With images of rover stations pulled from cyberspace, he showed the two basic types – "run and gun" and "stop and shoot".

As their names indicate, the difference between the two is the former does not require the setting up of any antennas because they are all mounted and ready to fire.

The benefit of rover operation is the ability to operate from more than one grid square within short time spans. Peter VK3KAI said, "During six hours is it easy to work from four grid squares and reap the scoring benefit not only for yourself, but also enhance the scores of others."

Theoretically, if a rover selects a four grid square corner, it only needs to move short distances. In practice finding such a corner that is accessible and suitable can be a challenge.

In a separate presentation, Peter VK3KAI gave details of useful mapping software for use by those operating portable or mobile.

The GippsTech program also included:

- Chatham Island DXpedition – Bob McQuarrie ZL3TY
- Update on EMR standards – Doug McArthur VK3UM
- An aircraft luggage compatible portable mast and Yagi for 2 m – Mike Farrell VK2FLR
- VHF/UHF activation of VK9L Lord Howe Island – Rex Moncur VK7MO
- Determinants of receiver sensitivity – Doug McArthur VK3UM
- A forum on VHF/UHF and Microwave contesting.
- A discussion on amateur licence reform.

GippsTech 2004 will be held on the weekend of 3-4 July. Anyone interesting in joining the program as a presenter should contact Peter Freeman VK3KAI, Chair of the Organising Committee, on email vk3kai@qsl.net

The creator of WSJT

By Jim Linton VK3PC

A suite of computer programs developed for weak signal working has opened a new chapter for amateur radio experimentation, with a few users eagerly pushing it to its limits.

Keynote speaker at the GippsTech 2003, an annual technical conference for amateur radio VHF/UHF and microwave techniques, Joe Taylor K1JT gave an insight into the software he developed that has revolutionised weak signal communication.

His personal interest in amateur radio started as a novice operator in 1952, when along with his brother Hal, in New Jersey, he began exploring the world of VHF communications.

Among their achievements was winning a VHF contest through the use of collecting multipliers by ionospheric scatter, a weak signal technique that was not widely understood.

Joe's initial amateur radio interest led into his professional life as an astrophysicist where he applied special techniques to extract extremely weak signals from the stars.

Ultimately he gained the Nobel Prize in Physics in 1993, shared with Dr Russell A Hulse, ex-WB2LAV, for the discovery of the first binary pulsar. That discovery sparked research into astrophysics that puts Albert Einstein's theory of relativity to the test.

Return to amateur radio

Inactive in amateur radio for several years due to his professional endeavours, he returned in 1999 to the hobby he readily credits with his success in physics.

In 2001 he released free software known as WSJT for VHF meteor-scatter communication. It is a computer program that makes it possible to communicate with very brief signals, commonly referred to as pings, which require special techniques to enable the transfer of meaningful information due to the short duration of the signal burst.

Joe later released a second mode which allows reception of very much weaker signals than would be possible using the traditional methods of SSB or CW.

Today WSJT, with four propagation modes, is known to be in use by a large number radio amateurs in the Americas, Europe, Africa, Japan, Russia, New Zealand and Australia.

Software development is continuing with some changes being promised soon. Joe K1JT explained: "I normally first implement proposed changes in a simulator, which I have just developed in software."

"It enables me to test out the new protocols and do transmission and reception tests between one computer and another with some generated noise to simulate the real electromagnetic propagation mechanism."

At GippsTech 2003 he described one proposed protocol that would use coherent or synchronous signal detection. That is known to be extremely effective for very weak signals based on the results of limited on-air testing.

It was obvious from Joe's presentation, and spending some time with him during the two day conference, that he very much enjoys what he's doing, and his enthusiasm is infectious.

"The main purpose is for fun, and the kind of fun that makes amateur radio so enjoyable," said Joe K1JT.

Impressed with GippsTech 2003

In praise of the organisers and the presenters, Joe K1JT said, "I am extremely impressed. This is a group of people much like radio amateur clubs and groups I've mixed with in the United States and elsewhere."

"But they're a relatively sophisticated group. These people are more than just dabblers. They are extremely interested in the details of what makes radio work, propagation mechanisms so varied and interesting.

"The details of honing an amateur radio station to the very highest level of capability are all represented in the papers delivered by the presenters."

When asked if he personally learnt anything by attending the conference, Joe K1JT replied, "I certainly did. Some fascinating results."

He (and all who attended) were particularly struck by Andrew Martin VK3KAQ's presentation on the acoustic probing of the atmosphere, and its findings in relation to tropospheric duct propagation.

Joe Taylor K1JT, Keynote Speaker at GippsTech 2003

Joe K1JT spoke to Andrew after his presentation to discuss in greater detail his findings about the mechanisms involved in tropospheric propagation. He also obviously enjoyed chatting with those who had home-brew equipment and antennas on display.

Future of amateur radio

The topic of the WIA's proposal for a new entry level licence was discussed at the conference. During a session led by the author of this article, there was clear support for the WIA initiative.

Later Joe K1JT was asked his view on the discussion session. He replied, "We were all discussing the question that concerns many of us that we may not be replenishing our ranks at the level that would be healthy for society and our own national interests.

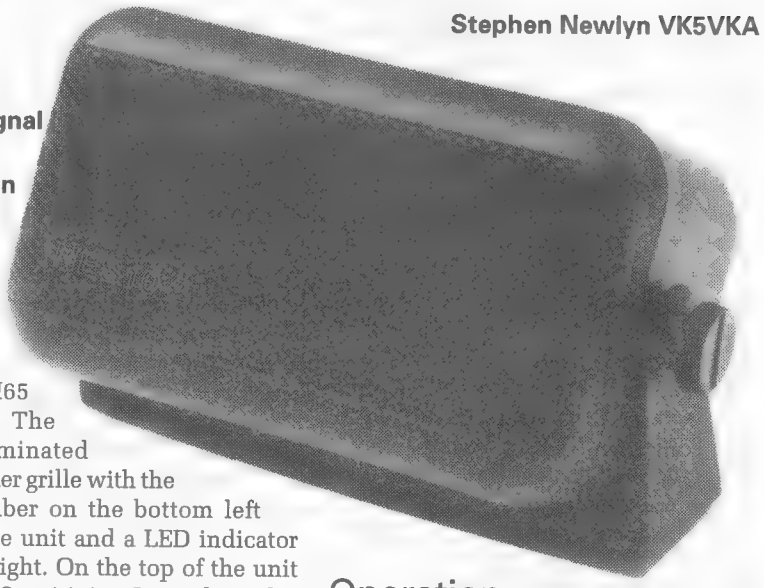
"Amateur radio has traditionally been a mechanism for getting young people involved with science and technology."

However, these days "We are not interesting enough youngsters in these kinds of things," he said. It was interesting to hear that Australian radio amateurs share the same concerns as those in the United States.

Product Review

The bhi NES10-2 DSP speaker

Stephen Newlyn VK5VKA



Since the demise of VNG (Australia's HF Time Signal Service) I have been trying to work out a way to receive time signal station WWVH from Hawaii on 15 MHz with a clearer signal during the Australian daytime. Most days WWVH starts to fade into South Australia around 0300 UTC but the signal is noisy from natural noise as well as some local electrical interference.

In late 2002 I saw a review of the bhi (http://www.bhinstrument ation.co.uk) NES10-2 DSP speaker in the UK publication "Shortwave Magazine" which gave the product a good review and then finally I saw a review in the Australian publication "Radio and Communications" March 2003 edition.

I've heard about DSP on high end receivers and transceivers but because of the cost I was not prepared to buy one of those (well at least not until the DRM receiving mode is provided for, but that's another story!). Well; I decided to buy a NES10-2 speaker and spent $AU339 (including postage within Australia) from the official dealer, Andrews Communications in Sydney. They can be found on the Internet at (http://www.andrewscom.com.au/).

The speaker arrived double boxed so there was very little chance of damage during transit from Andrews and it was sent registered post.

The United Kingdom manufactured bhi NES10-2 is small in size, coloured black, rectangular in shape and its size is W110 x H65 x D55 mm. The front is dominated by the speaker grille with the model number on the bottom left corner of the unit and a LED indicator on the top right. On the top of the unit there is a "Sensitivity Control" and a "On/Off Noise Cancellation" switch.

On the rear of the unit are "Dip Switches", a printed "Noise Cancellation Selection Table", "Audio Input Lead" and a "DC Power 2.1mm socket".

On the left side of the speaker is a "Headphone" socket. On both sides of the unit you have support for the supplied and fitted "Mounting Bracket".

Accessories supplied (for the Australian Market) include a Mounting Bracket, 2 Fixing Screws, 4 Small Self Adhesive Feet, 24 Page Operating Manual and a 2m DC Power cable.

Stephen Newlyn VK5VKA has had an Amateur Licence since 1991 and has been Shortwave Listening for about 30 Years. For a number of years he was Chief Editor for "DX Post" of the now closed Shortwave listening "Southern Cross DX Club", and has written articles for "CB Action" and "Two Way" magazine during the 1980s.

Setting Up

After a good look at the manual, which is well written (Yes! I am one of those who reads the manual first!). I proceeded to hook up the unit to DC power, unfortunately due to how my radio shack is laid out the DC supply was 3 metres away so I had to make my own cable, as the supplied cable was 2 metres long.

I then connected the supplied 2 metre long speaker cable to the test receiver (in my case a Drake R8A Communications Receiver which needed a 6.5mm adaptor as the supplied cable uses a 3.5mm plug).

Operation

There is no actual on/off power switch for the speaker, so you just turn on any 12-28 volt dc power supply to operate the unit.

As power is turned on the LED light glows. The LED indicates which position the "On/Off Noise Cancellation" switch is set. If the LED is glowing red it indicates that DSP function is off and if it's coloured green it indicates the DSP function is on. If you are colour blind though the intensity of the LED changes with mode so you can easily see the mode change.

There are two controls which once set rarely need to be adjusted (unless of course you change the connected receiving equipment or encounter a signal that needs extra processing). They are the "Sensitivity Control" and the "Dip Switches".

The "Dip Switches" by default are already set to Level 6, this setting appears to be well thought out as I found pretty much that this is the optimum setting for general use. However you may find a lower or higher setting to be more suited to your situation.

The operating manual says that the "Sensitivity Control" is set at first, by turning it fully anti-clockwise and then turning it back a quarter of a turn." Further adjustment may be necessary

Gil Sones VK3AUI
30 Moore Street, Box Hill South Vic 3128

PA0FRI's S-Match Antenna Tuner

An interesting antenna tuner appeared in the *Technical Topics* column of Pat Hawker G3VA in *RadCom*, March 2003 and also in *Electron*, June 2003. The author was Frits Geerligs PA0FRI who presented an Antenna Tuning Unit which he had developed to provide a symmetrical and universal ATU system.

The development of the S Match is shown in Fig 1(a). The final design is shown in Fig 1(b)and Fig 1(c) where one and two toroid versions are shown. The transformer is part of the tuning system and a ferrite toroid is not suitable for high power and the windings need high voltage insulation. With some antenna systems a better match can be obtained when the antenna is connected as shown by the dotted line shown in Fig 1 (b) and Fig 1 (c).

The single toroid version , shown in Fig 1(b), uses a T200-2 toroid for powers less than 400 watts or a T200A-2 for powers over 400 watts. The winding of the T200-2 toroid is 2 x 8 bifilar turns of Teflon covered wire. Note that this gives 4 windings of 8 turns as shown in the diagram. The T200A-2 toroid is wound with 2 x 6 bifilar turns of Teflon covered wire.

The double toroid version , shown in Fig 1(c), uses two T200-2 toroids for powers greater than 400 watts. The winding of each of the T200-2 toroids is 11 bifilar turns of Teflon covered wire.

For both Fig 1(b) and Fig 1(c) if any imbalance occurs interchange connections to a and d (and/or b and d).

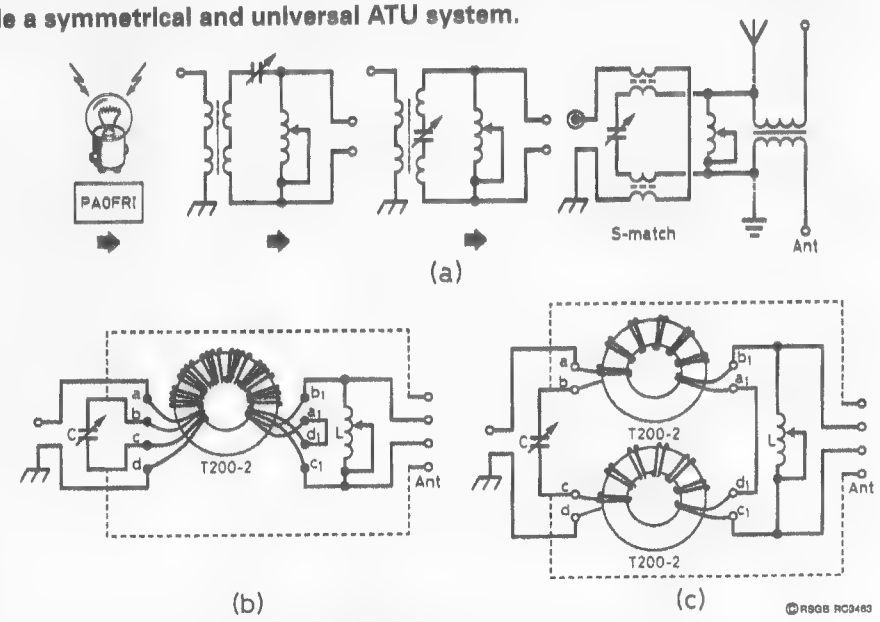


Fig 1.(a) Development of PA0FRI's S match symmetrical and universal ATU. (b) Single toroid version. (c) Double toroid version.

For 10 to 160 metre operation the roller inductor L should have a maximum inductance greater than 20 microhenries. Capacitor C should have a maximum capacitance greater than 200 pF and a minimum capacitance less than 15 pF. The inductance a-a_1 + d-d_1 is about 3 microhenries. For 10 - 30 metres a-a_1 + d-d_1 is less than 3 microhenries and for 30-160 metres a-a_1 + d-d_1 is greater than 3 microhenries.

As both input and output are isolated the system can also be used for single wire antenna systems working against ground.

Product Review:The bhi NES10-2 DSP speaker *continued*

but most modern equipment will accept the settings mentioned in the manual. By the way the "Sensitivity Control" is designed so that it cannot be easily changed (accidentally bumped etc).

Well the next thing to do is to switch "On/Off Noise Cancellation" off and then find a signal which has a bit of noise. Then switch on the "On/Off Noise Cancellation" switch. It may take a couple of seconds for the DSP to work when you will notice a distinct improvement in audio quality with less noise and in most cases a much more listenable signal.

I've tried it on all types of signals including AM Shortwave Broadcast, Long Wave Beacons, SSB and Morse Code signals. Audio quality is improved substantially.

On some signals there is a "Robotic" sound on some voice type signals but actual clarity is better than listening to the noisier unprocessed signal.

Leaving the "On/Off Noise Cancellation" switch on sometimes make you wonder whether the radio is actually working because it makes background noise almost disappear as the usual crackle and pop is virtually gone.

Conclusion

Some products when released, arrive with a lot of hype and fanfare and turn out to be not as expected; however in the bhi NES10-2 speakers case I believe that this is not the case. I would thoroughly recommend this product to any one wanting to improve their reception of radio signals without spending a huge amount of money on a new DSP based receiver or transceiver.

Notes

This product was bought outright by the reviewer and is not a free review unit. The unit was not tested with any test equipment apart from my ears and comparing signals. For USA based readers this product is sold as the GAP HEAR-IT. Please check the website at *http://www.gapantenna.com/*.

ar

Technical Abstracts

The protector

A device to protect your transceiver from over-voltage or reverse polarity was described in *QST*, June 2003 by Mike Bryce WB8VGE. The device is designed to be placed between the radio and the power source and it will provide protection against a reverse connection to the power source as well as protection from the power source rising to an excessive voltage. A delay circuit helps protect against turn on transients.

The circuit of the device is shown in Fig 2. The power source is connected to the radio by a relay which is a high current 12 volt relay. The resistors in series with the coil are to reduce the current drain and allow the relay coil to run cooler. The relay used was a 40 amp contact device with a 12 volt coil. The relay drops out when the power source falls to around 9 volts providing a low voltage disconnect.

The delay start is provided by U2A and Q1. U2A provides the delay and Q1 holds the drive off to the relay until the delay has elapsed. Q1 also removes the drive to the relay when an over-voltage is present. An over-voltage is detected by the voltage drop across D2 which is a 14 volt Zener together with the voltage drops across D1 and D3. The over-voltage trip point is in the region of 15 volts. Adjustment is by using a different Zener voltage.

A low voltage warning is provided at approximately 10 volts prior to the relay dropping out in the region of 9 volts.

One addition to the original circuit is D8 which is placed across the reverse polarity LED to protect it from reverse voltage which may damage it in normal operation. Most LEDs only have a fairly low reverse voltage rating.

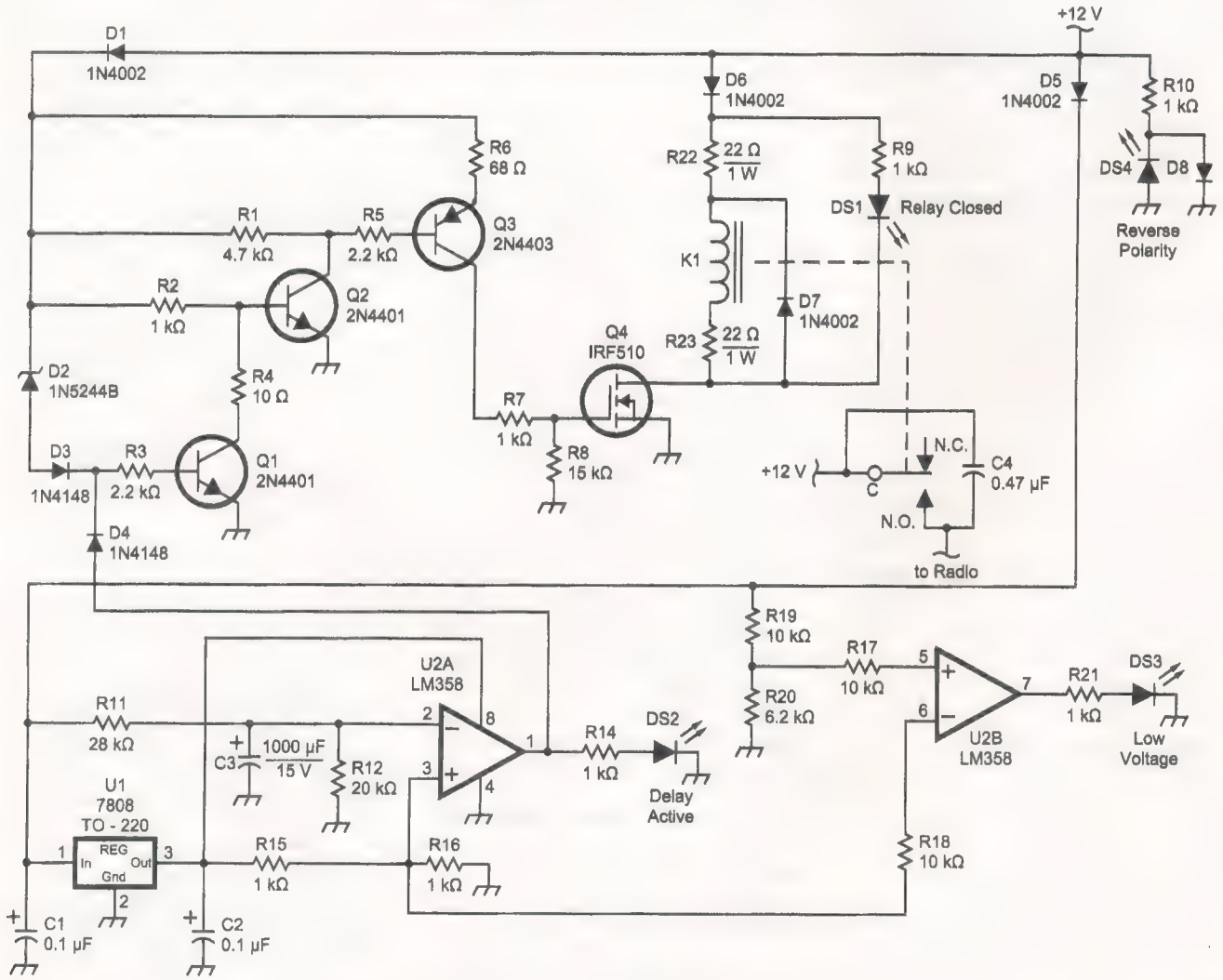


Fig 2. The protector DC input watchdog and shutdown circuit.

Hanging wires flexibly from trees

An interesting method of hanging wires from trees appeared in the *Hints and Kinks* column of Bob Schetgen KU7G in *QST*, July 2003. The idea came from Jack Schuster W1WEF who has several antenna wires strung through a wooded area around his home. To minimise wire breakages when branches fall Jack developed a means of flexibly hanging the wires.

The wire hanger is shown in Fig 3. All Jack's antenna wires are #14 or #12 AWG insulated stranded wire. The wire hanger is made out of an 8 inch piece of #14 AWG solid insulated wire. The hanger is made by winding close to 4 inches of the hanger wire around the antenna wire each side of the loop of rope, used to support the antenna wire, which is looped around the supporting branch. This leaves plenty of opportunity for the supporting branch to move. Should the antenna be struck by a falling branch the tie wire can unravel and leave the antenna wire unbroken. The antenna can then be repaired by clearing the fallen branch and redoing the wire wrap.

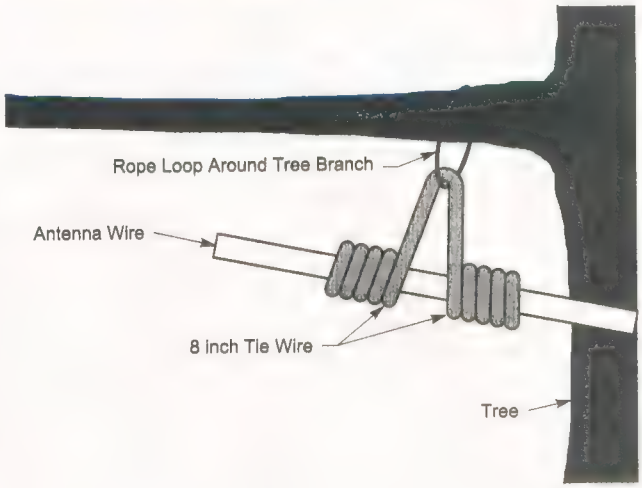


Fig 3. Wire wrap used by W1WEF when hanging antenna wire in trees. A falling branch causes the wrap to unravel and release the antenna wire before it breaks. The repair is then simply to clear the fallen branch and redo the wire wrap.

Cable and Connectors

Belden

- RG58C/U Belden 8259 @ $0.90 per metre
- RG213/U Belden 8267 @ $4.45 per metre
- RG8/U Belden 9913 Low Loss @ $5.15 per metre
- RG8/U Belden 9913F7 High Flex Low Loss @ $5.55 per metre
- RG8/U - RF400 Belden 7810 Low Loss Sweep Tested to 6000MHz @ $6.30 per metre

LINK

- RG58: B80-006 UHF connector (M) @ $7.65 each
- RG8/213: B80-001 UHF connector (M) @ $8.80 each
- RG213: B30-001 N connector (M) @ $9.10 each
- RG8: B30-041 N connector(M) @ $14.00 each

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Remember JOTA 18 & 19 October

Amateur Television in VK5

By Barry Cleworth VK5BQ

This article is intended to give a general overview of Amateur Television activity in South Australia, and to provide an information base for interested hams to set up a station on 1250 MHz FM or above. ATV is a fascinating mode that goes beyond just basic communications, but provides limited entertainment, and self instruction in the art of building equipment through the medium of vision.

There may be a perception by some amateurs that programme material may be restricted to perhaps test patterns or colour bars with little interest but let me assure you that this is not the case. Whilst copyright provisions obviously preclude the transmission of commercial broadcast material including tapes, there are many hams ready to play their holiday videos over ATV, and when well taken, these can be quite interesting and entertaining. Public shows such as speedboat racing, processions, ham conventions, barbecues and parties given by AR friends are always interesting to see. Radio club lectures have also been televised.

One of the most interesting activities is the display of our shacks and equipment, including new ATV transmitters and allied equipment being built.

Another interesting use for ATV is the connection of the home computer via a suitable video card in the computer to your transmitter. When the video card in the computer has a TV output capability and can be switched to a 50 Hz frame rate, the pictures or text can be fed to the transmitter with flicker free results. Personally, I found this particularly valuable several years ago when I had purchased a new computer and had to learn how to use it. Lee VK5YLE being very computer literate viewed my signals from over 70 km away giving me valuable tuition on the computer that was appreciated.

Requirements to build a station

There is no doubt that it is far easier to set up an ATV station now compared with the 60s and 70s when people like Maitland VK5AO and others made their own cameras and sync. pulse generators, in addition to receivers, transmitters and antennas.

Perhaps the first and most expensive item to obtain may be the video camera, but these may be obtained fairly cheaply second hand. A shack camera doesn't have to be the latest digital wonder. Many stations use cameras such as the early CCD Panasonic M7 cameras or similar which may be considered too bulky for the family holiday, but are ideal to start an ATV station. The next commercial items to look for would be TV sets and satellite receivers. Receivers for FM ATV (on 1250 MHz and above) up to the mid nineties were usually home built, from front end converter to IF and video and audio output stages. Since the introduction of digital satellite TV, the availability of surplus analogue Satellite receivers has made the receive requirement very much easier.

Satellite receivers have been sometimes obtained for as low as $50 or even less (for example the "Ward" brand), but prices may range up to $100 and beyond, some being new and others secondhand. When looking for Satellite receivers and TV monitors it is advantageous, but not essential, to find a make which has no blue screen video mute system, or a mute system that can be switched off via the menu. The reason for this will be apparent when searching for weak signals. When the sync. pulses become very weak or disappear, the blue mute is triggered making it difficult to peak up your antenna from a noisy picture. Most of the latest TV receivers have this facility but fortunately it can be switched off. Old TV receivers will not have the blue mute system but some of these will also not have AV connections which are a distinct advantage, if not a necessity. However, sometimes older TV sets may be used by connection to the RF out socket of a VCR. The old analogue computer monitors such as the Commodore 1084S are also very satisfactory for use instead of a TV set, if in good condition.

Since the tuning range of most satellite receivers is about 900MHz to 2150 MHz depending on the make, the connection of a suitable antenna to the receiver followed by video and audio output connections to a TV receiver, will enable

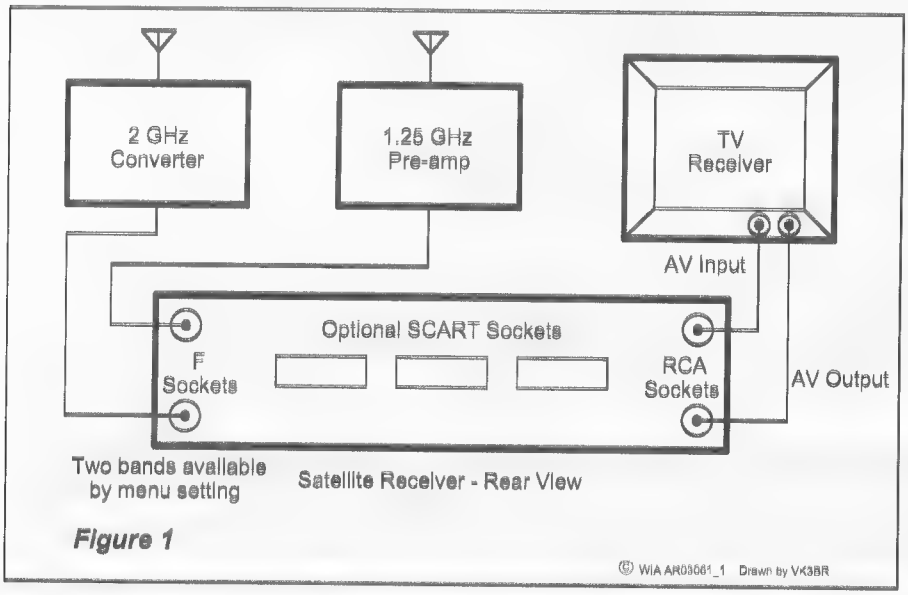


Figure 1

the viewing of most 1250 MHz ATV signals, providing the path between the respective locations is reasonably unrestricted. However there are many variables to be considered and sometimes trees, when wet may cause a problem, but should not always be blamed. I have regular daily contacts with Graham VK5JD on 1250 MHz looking through a several hundred metres long stand of large Eucalypts, with a total path distance of over 80 km Rarely is the signal much less than noisefree.

To increase the range of reception on 1250 MHz, a preamplifier may be employed, but if reception of 2 GHz 5 GHz or 10 GHz is contemplated then the addition of a converter preceding the Satellite receiver will be necessary. In this case a preamplifier is not usually required for good sensitivity.

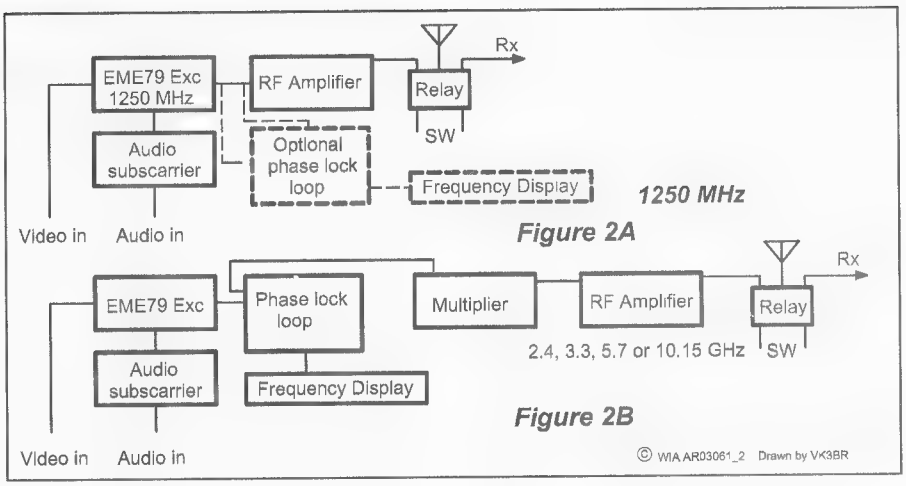
Figure 1 shows some simple hookups to form a receiver for two bands.

Most satellite receivers have two 'LNB' inputs that can be entered into the memories of two separate channels to facilitate band switching.

The transmitter

Complete commercially built up amateur transmitters for 1250 MHz FM and above are not normally available, at least in Australia to my knowledge, with the result that this phase of the project is still in the realm of the "home brewer". However, the project becomes relatively easy and quite interesting with the use of kits being available for the various sections of the transmitter. One of our early ATV pioneers on wideband FM ATV, Mark VK5EME, designs and markets excellent kits under the name of Minikits. Details of these kits are readily available on his website, www.minikits.com.au

Prices for the kits are very reasonable, particularly when compared with overseas products. A particular advantage in the use of kits is that the various sections of the transmitter can be purchased and built up over time as your budget permits. Comprehensive instructions are included with every kit and providing care in construction is exercised the results will be excellent. The block diagrams in figure 2a - 2b illustrate how a particular transmitter may be assembled from built up kits. The kits are subsequently mounted in a box, after which they are interconnected to form a complete transmitter .The exciter and audio subcarrier board kits can be used as the basis for a switched band ATV transmitter, but I have opted for separate exciters for each band.



Some of these kits are intended for experienced constructors, and although adequate instructions are included with the kits, I will make a couple of extra points. Since most of the components are of the surface mount (SMD) variety and are very tiny, they may be a problem for some constructors with eyesight deficiencies. However, this usually is easily overcome with the use of optical aids (e.g. various types of magnifiers) to allow the work at hand to be viewed at very close distances which is very important.

Another consideration is the soldering iron. It is important to use a suitable low voltage, anti static iron with a very fine tip and sufficient heat. The joint must be made quickly and precisely with a steady hand, otherwise some types of PCBs may be damaged by prolonged heat, and the possibility of short circuits from solder 'dags' will be a problem where the boards cannot be examined clearly at close range. Also be very careful not to mix up component values, as the surface mount chip capacitors, for example, are not individually marked with their value. All these tips will be readily obvious to experienced constructors but I feel it should be mentioned for the sake of newcomers to small SMD components.

From the various kits on offer it will be seen that there are choices available. For example the EME79 kit can be used as a 1250 MHz exciter, with free running oscillator, followed by an RF power amp of up to 18 W output, and when combined with a 5.5 MHz audio subcarrier kit, it will be a complete transmitter, ready for connection to a video camera and antenna. This is illustrated in Figure 2a.

The stability of the free running oscillator is quite satisfactory, particularly for strong signal paths when any frequency drift up to a few megahertz is just not noticed, but if it is desired to improve the drift factor, and also be able to accurately know and vary the frequency, a phase locked loop kit can be added, as an option, shown in figure 2a. Multiplier kits are also available to enable operation on the higher bands, for example 2.4 GHz, 3.3 GHz, 5,7 GHz, and 10 GHz, as shown in figure 2b, and the inclusion of the phase locked loop kit for these frequencies is really essential. For correct alignment on frequencies above 1250 MHz, it is desirable to have access to sophisticated test equipment, e.g. A spectrum analyser and microwave power meter.

Full details of all kits are available on Mark's website.

Deviation used in amateur television is approximately plus and minus 3 MHz giving a total channel bandwidth in the order of 18MHz or greater, which is more than adequate for amateur purposes, Wideband FM easily produces good quality transmissions and is still used in broadcast stations in some OB, and other applications. For amateur television the weakest link is normally the video camera which will determine the vision quality.

The antenna

Antennas for use on 1250 MHz and above vary in size, gain and building difficulty depending on the results required and the frequency of intended use.

The simplest antenna to build is the so-called double diamond or bow tie that has been used on 1250 and 2400 MHz When used with a reflector, the gain of this design is usually approximately 10 dB, and is mainly used on short path lengths of the order of 10 to 20 km. I have seen an antenna of this design situated **inside** the shack of David VK5KK receive 2.4 GHz signals noisefree from a repeater about 10 km distant. Granted, the path was quite clear but it demonstrated the advantage of such an antenna, particularly for use by amateurs in difficult locations where repeater operation only was possible over a short path length.

Whether transmitting to, or receiving from stations (including repeaters) at greater distances, consideration should be given to the use of higher gain antennas such as the popular loop yagi, or parabolic dish. Examples of distances regularly worked will be described in a following section.

Loop yagis being most suitable for 1250 MHz, and 2.4 GHz, are not difficult or expensive to make, and have been described in various amateur radio text books and magazines. Depending on the boom length that can vary from 6 feet to 12 feet for a 1250 MHz design, the gain may vary from 18 dbi to 20 dbi. Making up the loops from aluminium or copper sheet may be a little tedious when the number required is 40 or more, but the effort is well worthwhile, as the end result is a relatively inconspicuous, but effective antenna for use in sensitive suburban locations. Normal yagis such as the K1FO or DL6WU design should also be considered as they also work very well.

Parabolic dishes however, will require a little greater degree of skill in metal working, with the availability of brazing or mig welding equipment being required, when an open tubular steel framework is employed. Dishes used at my station for 1250 MHz, 2.4 GHz, and 5.8 GHz are home built using a framework of half inch square steel tube formed on a profile, brazed to a center support, and covered with 1/4 inch galvanized mesh. An examples of these are shown in Photo 1. The use of mesh has the distinct advantage of producing minimal wind resistance, resulting in mounting methods being less critical. The size of the mesh varies depending on the frequency of intended use. 1/4 inch mesh is used in my dishes on 1250, 2400, and 5870 MHz, but a larger mesh would be quite satisfactory on 1250, as long as the size is not greater than about 1/10 of the wavelength.

Where operation on 10 GHz is contemplated, 600 mm pay TV type dishes are very suitable, being available commercially and one of these is used at my station for 10 GHz receive. The feed is a modified commercial satellite LNB.

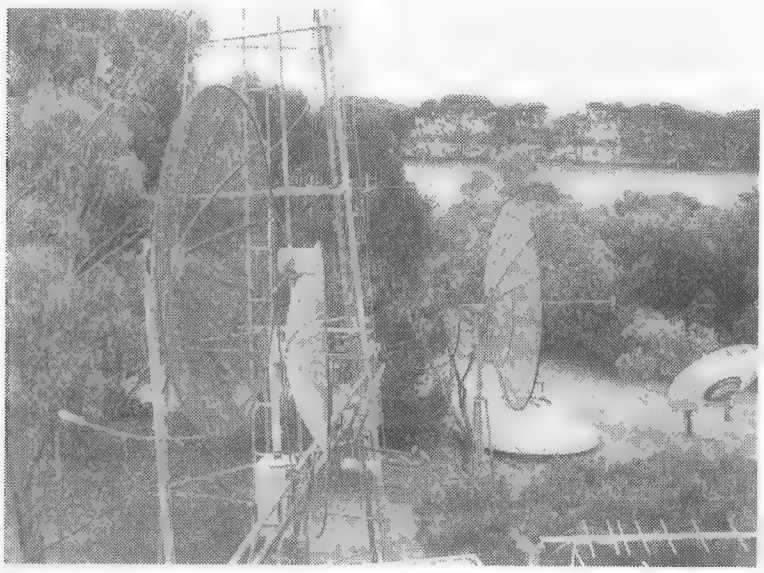


Photo 1

Notwithstanding the extra constructional difficulties involved for a parabolic dish, the extra gain achieved makes it all worthwhile. Depending on the size of the dish with a particular frequency used, gain can vary from 25 dB to 30 dB or more. The sizes of my dishes vary from 2.1 metre in diameter for 1250 MHz, to 1.2 metre for 2.4 GHz and 5.8 GHz

Gain of a dish will increase with the size of a dish used for a given frequency. One of the advantages of microwaves particularly at 5.8 GHz and above is the ease of obtaining quite high EIRP using dishes of moderate size of about one metre or less. Consequently this will require transmitter powers of only a few watt for relatively long distance contacts.

For example, I regularly receive Ben VK5RD on 10 GHz ATV over a path length of 70 km at P5 for about 90% of the time. Ben's TX output power is only 1 watt, with 600 mm parabolic dishes used at both ends. The amazing fact is that we are nowhere near line of sight, both of us being of the order of 33 metre ASL inclusive of antenna height. The path is mainly over water and we are most likely being assisted by an evaporation duct, situated fairly close to sea level. For the purpose of indicating video signal strengths the "P" scale is used, and is described as follows.

Impairment	Video S/N (Unweighted)
P5 Imperceptible	41 dB
P4 Perceptible but not annoying	33 dB
P3 Slightly annoying	29 dB
P2 Annoying	24 dB
P1 Very annoying	19 dB (estimated)

The above table is sourced from ITU-R references and lists vision subjective and objective ratings.

Discussion as to the choice of feed type for the dish is beyond the scope of this article, however various types have been tried including waveguide type feeds which are easy to make from various published articles. Usually the choice is determined by the F/D ratio (Focal Length/Diameter) and the frequency in use. The testing of the feeds for SWR etc. however, is not easy for people without special test gear. However, it is possible to make some of these feeds and have a lot of fun without actually knowing exactly what the gain and SWR is, providing duplication of a proven design is accurately undertaken.

Activity on the various ATV bands

Since the cessation of the AM repeater VK5RTV on 576 MHz, most ATV activity is on simplex FM on 1250 and higher frequencies, examples of which will be described later. However, an excellent repeater VK5RHV, on the frequency of 2.439 GHz has been recently designed and built by Ben VK5RD. This repeater is situated on a hill approximately 200 metre ASL, and has a very extended coverage across Adelaide. It is received at a strength of P5 with plenty of headroom (i.e. dbs above the noise) at my QTH that is approximately 70 km west, across the gulf of St. Vincent, at a height of 33 m ASL. The input frequency is currently 426.25 MHz AM, but may soon be modified to include an alternative input on 3GHz FM.

Another repeater on 1283 MHz (VK5RWH) exists on the same site but with limited coverage mainly to the North and South.

1250 MHz is the most widely used frequency for ATV in VK5, including daily simplex contacts from my station in Stansbury to various destinations near Adelaide. Contacts made are invariably over distances of 70 to 86 km, and sometimes further. Viewers often use prearranged frequencies on 70 cm and 2 m for liaison purposes.

Duplex contacts are also often made involving various combinations including 1250 MHz, 2429 MHz, 5760 MHz and 10.35 GHz. To increase flexibility by including a group of stations, Steve VK5SFA, who has an elevated location, often receives three stations simultaneously on different frequencies, and by adding video from his own station is able to input four video signals to a quad splitter. He also mixes the audio sources using an audio mixer. The outputs are then fed to his 1 watt 10.150 GHz transmitter coupled to an almost omnidirectional antenna covering most of Adelaide. His signals are also received at Stansbury, over 80 km away. This makes possible a very interesting 'round table' contact, an example of which is displayed in one of the attached photos. Each of the participants is able to see and hear the 10.150 GHz signal so they can look and speak to each other in real time. Great fun!

Although the parabolic dishes we use have a relatively sharp pattern, when signals are strong due to enhanced propagation, reception is possible over a wider than normal area. However, to include other stations not being able to see my transmissions for example, it is possible to transmit on several bands simultaneously, e.g. 1250, 2400, 5800,

Continued on page 30

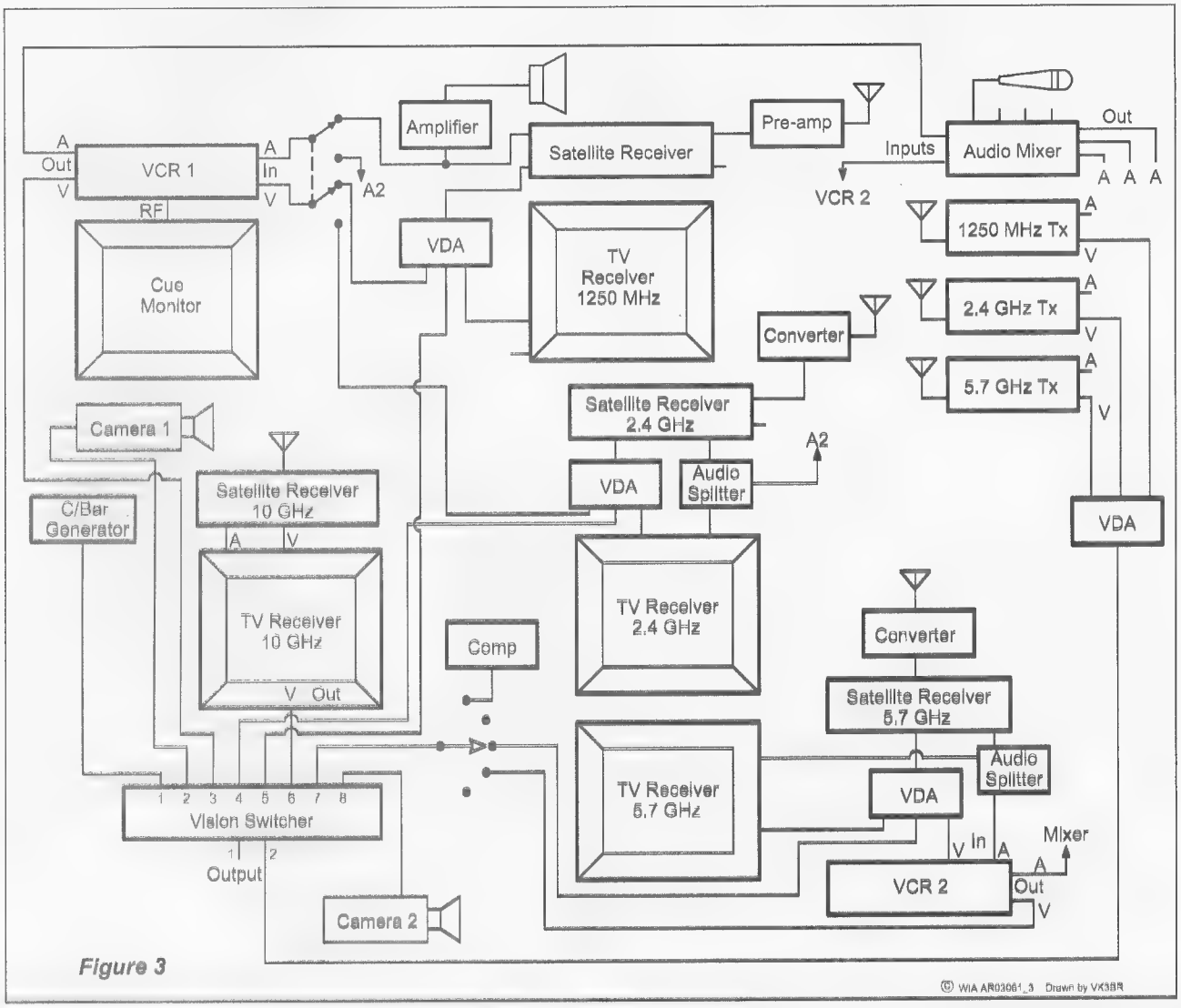


Figure 3

© WIA AR03061_3 Drawn by VK3BR

The wonderful world of GippsTech2003

By Jim Linton VK3PC

Photo 1: Thinking of the possibilities is Gavin Brain VK3HY with a potential dish for an antenna.

Photo 2: WIA Federal President Ernie Hocking VK1LK discusses a point with Mike Farrell VK2FLR.

Photo 3: Examining construction techniques are John Patterson VK3ATQ (left) and Ian McDonald VK3AXH.

Photo 4: Plenty of interest and sales at the component tables.

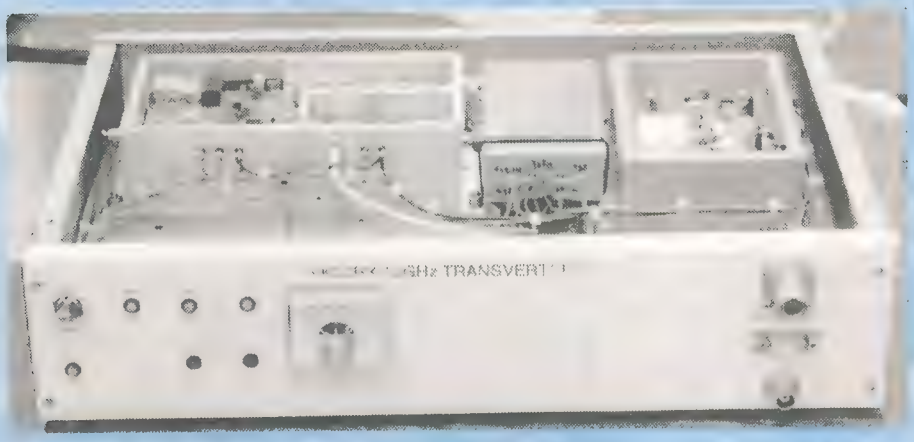


Photo 5: A much admired transverter was one of the homebrew items on display.

Photo 6: Denis Johnstone VK3ZUX (left) hands the published GippsTech proceedings to Peter Elton VK3KG.

Photo 7: A homebrew portable antenna with Rex Moncur VK7MO and Joe Taylor K1JT.

Photo 8: One of those who snapped up an ex-commercial microwave "bargain" was Tom Corrigan VK3XBG with Gilbert Hughes VK1GH looking on.

Amateur television in VK5

Continued from page 27

but of course antennas have to be separately rotatable.

Another variation is to relay a particular station on another band to provide reception to a station out of view of the originating signal.

This is frequently done at my station, for example: Originating transmission received from VK5RD on 10 GHz is received at VK5BQ, then relayed to VK5AO on 5.7 GHz, after which VK5AO may further relay it on 1.25 GHz with his antenna covering a large part of Adelaide. The total distance is about 180 km, providing the quality of waveform including syncs. of the originating signal is very good. There is no problem with synchronisation and /or colour, despite the lack of reconstitution of sync. pulses and other adjustments.

Ancillary station requirements

To pursue some of the above activities it is necessary to split the video and audio signals to simultaneously feed various transmitters as required. In the professional field various types of vision distribution amplifiers (VDA) are in very common use, some using a variety of compensation adjustments, which may be necessary for a variety of reasons. However for amateur use it is possible to use very simple VDAs such as a particular design featured in an article in the BATC 'ATV' Compendium.

This design is incredibly simple, using a video switching IC (TEA5114) selected not for it's switching capabilities but to obtain signal amplification and isolation for the three video outputs obtained from one input. Apart from the inexpensive IC required there are only five resistors, four capacitors, and four sockets used to build the unit, which is powered from a 12 volt supply.

Another essential item is of course an audio mixer to distribute a variety of audio sources to various transmitters as required. The design of a suitable audio mixer may vary, but in my case a couple of microphone inputs are used in addition to four or five line level inputs, plus about four line level outputs. The line level inputs will be required to relay the audio from incoming ATV signals on other bands, liaison channels, outputs from VCRs, and possibly output from a touchtone pad for repeater control. In my case this audio mixer is home designed and purpose built, but there are various kits available from the usual electronic suppliers. It is also possible to purchase kits for VDAs from the same suppliers, but these are a little more expensive than the one described in the preceding paragraph.

Photo 2

Vision switching is also a very desirable feature in any TV station, the homebuilt unit in use at my station being designed for ATV by a member of our ATV group. It has eight inputs and two outputs and is fully electronic with pushbutton switching. There are also designs featured in the ATV Compendium mentioned above.

However for amateur purposes it is also possible to use a simple mechanical rotary switch of good quality. Figure 3 shows how the video switcher and audio mixer are used in conjunction with the VDAs, VCRs, receivers, transmitters, etc. being set up to enable quick relays, playing of video tapes etc. The layout shown in figure 3 has evolved over many years and is still changing.

Power supplies

So far I have not mentioned power supplies, and do not intend to go into precise detail here due to the varying requirements of some of the final amplifier stages. However it must be emphasized that the output voltage must be regulated with over voltage protection and the current output capability should be of the order of 10 amp or more. Additionally the usual fuse or circuit breaker facilities are also essential.

Where special bias voltages are used for some final amplifier stages, it is also essential to provide bias fail protection circuits in the supply.

However there have been many articles published in the past, in various magazines, incorporating some of the these requirements.

Three of the low voltage supplies used at VK5BQ have been built from the VK3 Moorabbin and District Radio Club articles featured in AR dated August 1988. This design by the above club is highly recommended, however it would be wise to consult the website of Chris VK3JEG for modifications to the circuit found necessary since it's original conception.

Bias fail protection circuitry is not included in the above supply and is not needed for the 1250 MHz transmitters, whereas some amplifiers used on 5 GHz and 10 GHz will need this extra circuitry.

Propagation Characteristics

Some of the problems with propagation on the above mentioned frequencies are well known to amateurs using other modes, as well as in the professional area. This is already well covered in the textbooks. However, let me say that there are many surprises for those venturing on to frequencies of 1250 MHz and above, especially when you receive 10 GHz TV signals in pouring rain on a non line of sight path, over a distance of 70 km, as I have from Ben VK5RD.

My QTH is well positioned for the reception of signals from broadcast TV, and at certain times of the year I have seen TV programmes which I am reasonably sure are emanating from Ballarat or Bendigo, which are approximately 300 to 400 kilometre South East of my location. If there are any well set up ATV stations in that direction including Mt Gambier, I would be delighted to take part in some test transmissions.

I hope that the information in this article will help encourage newcomers to the fascinating world of Amateur Television.

VK1 News

Forward Bias

Peter Kloppenburg VK1CPK

National Science Week, August 15 to 24, 2003 had something on offer for almost everyone here in Canberra. Of particular interest to radio amateur telegraphists and other users of the Morse code was the demonstration of a German "Enigma" cipher machine that was used so extensively during the Second World War. The venue for the demonstration was the 'Holy Grail Café' in the city, which was packed with scientists, students, computer experts, and radio amateurs on the evening of Wednesday, August 20.

Looking casually at the machine, it resembles an old switchboard, with its plugholes; lit-up letters display, QWERTZU keyboard and what looks like an overgrown odometer with three rotors. Each rotor is engraved with the 26 letters of the alphabet around the outer perimeter instead of numbers. One operator would set up the machine according to a pattern or code by setting the rotors in a predetermined sequence. This could be TXG or JFS. From then on, every time the operator pressed a key, the right most rotor would advance one step, and one of the letters on the display would lit-up. The second operator would note this letter, and when all the words of the message were typed in, the second operator transmitted the encrypted message using Morse code. The transmitted message included the same code, TXG or JFS, for setting up the machine at the receiving end, where deciphering was performed in reverse order.

A cumbersome way of sending a coded message, but it worked for a while, at least until the code was broken, first by the Polish army in the early Thirties, then the French and the British. A more permanent opportunity to view an Enigma machine is provided at the National War Museum right here in Canberra. It is located in the "1939 - 1945 Word War" section. There, the machine is on show with its hinged covers in the open position showing the mechanisms. While inside the museum, you can inspect exhibits of clandestine radio receivers and transmitters that were built by Australian prisoners of war (POW) in Timor. As there were many radio amateurs in the services, this is not surprising. The equipment was put together higgledy-piggledy with screws and nuts instead of soldering. One transmitter appears to have a push-pull output stage with two 807s. An interesting clue of how they were able to power the equipment, was a bayonet light socket plug that terminated the power cable. It seems possible that the POWs were staying in barracks equipped with electric light. One other exhibit is the SCR-602 RADAR unit from 1942 equipped with a bedstead type of antenna. This unit operated at 200 MHz with a 20 microsecond output pulse of nearly 50 kW. The receiver used 954 acorn valves and had an IF bandwidth of 140 KHz. The RAAF gave John Moyle, editor of Radio and Hobbies, a scoop, by giving him the details of SCR-602 for publication in the April and May issues of R and H in 1946.

The long-awaited discussion paper from the ACA has now become available. Every licensed radio amateur is urged to read it and respond to the questions. Drastic changes to the regulatory environment are envisaged by the ACA, and we should all try to let the ACA know how the amateur radio service should be changed

This month, on Sunday, the twenty-sixth, at 12 noon, there will be Trash & Treasure sale in the compound of the Parks & Garden Depot, Longerenong St., in Farrer. Buyers and sellers are welcome. A sausage sizzle and soft drinks will be on sale. Items on sale will include antique broadcast receivers, radio test gear, antique transmitting valves, 12-volt vibrators (remember?), communication receivers, and lots more. All proceeds to the Division!

The next general meeting, will be held at 8.00 pm on Monday, 27 October, 2003

Harry Williamson VK2JHW

It is with regret that we announce the passing of Henry Lee Williamson, better know as Harry VK2JHW. Harry was first licenced as VK2VVZ in 1979 or 80, having lots of trouble with cw. In 1984 Harry obtained the call VK2JHW.

Born in Melbourne on 8th December 1919, he and his family moved to England in the late 1920s, so Harry had all his schooling in England. When trouble started in Europe, the family moved back to Australia in mid 1936 and settled in the Canterbury area of Sydney.

Harry moved to the Wollongong area in the early 1970s. Harry had not been in good health for over twelve months and died peacefully in his sleep in hospital Sunday 14th September.

A private cremation was held Tuesday 16th September.

Harry will be sadly missed by all those that knew him.

Submitted by Brian VK2BUF
Hon Secretary
Illawarra Amateur Radio Society.
vk2ubf@fishinternet.com.au

Division News

VK4 News

Qnews

By Alistair Elrick VK4MV

Callbook calling

There will be a Callbook issued later this year and QTAC would like the listing of all Repeaters and Beacons to be as accurate as possible. Accordingly, QTAC are requesting all Groups and Repeater officers to have a look at the VK4 listings on http://homepage.powerup.com.au/~qtac or you can find it from the link on the WIAQ page. http://www.wia.org.au/vk4.

So if you see any items that have changed, or even blanks in the listings, then please advise Bill and Len your QTAC men of those changes.

Reply to qtac@yahoogroups.com or by mail to WIAQ PO Box 199 Wavell Heights, Qld 4012

Repeater calling

Len VK4ALF has a plan to establish an extended UHF repeater network in QLD. Those Amateurs, who are interested, can reply to the address of the group, which is: vk4-uhf-repeater@yahoogroups.com.

Sunshine Coast Amateur Radio Club and the demised Gympie Club (with some improvements in battery and solar cells) have the repeaters to kick off such a network. Where else to spread it to, somewhere on the Gold Coast?- somewhere in Brisbane-Maleny-Peregian-Mt Boulder?- somewhere in Bundy?- further north?

If anyone has contacts with clubs in Brisbane, Gold Coast or to the north please mention this concept and get the ball rolling.

November 8 Gold Coast HAMFEST

Well it is getting towards that time of year when the activities at the Gold Coast Amateur Radio Society get a little busy. These are some of the activities coming up.

The Hamfest will be held at the Albert Waterways Hall on the 8th November. The JOTA weekend will be getting underway in October and we will be giving all the details in the near future. Exams can be taken at any time to suit the candidate and you can contact Kath VK4KU our Education Officer on 5539 3530. Also the clubhouse opens every Saturday afternoon at approximately 1pm for amateurs to meet in a social environment.

Mornington Island to get connected

Eight specially modified shipping containers packed full of telecommunications equipment have reached Mornington Island. These innovative bright yellow containers will provide the backbone for the Mornington Island community's telecommunication needs. They hold radio transmission equipment, solar power generation panels, banks of high capacity storage batteries, and provide for diesel back up generators and tamper-proof fuel tanks. This also contains FM radio and television broadcasting equipment, as well as two-way radio equipment that can connect to outstations.

OH! and no doubt these containers running on solar power will not fall into the trap that one VHF radio tower has. The owner just received an account to pay the new VK4 community ambulance levy! Ag Force Chief Executive Officer Michael O'Neill said the property owner with a tower at Dingo, in Central Queensland, could not believe that the government was serious about making him and his wife pay the ambulance levy on the tower. "The VHF tower is for private use providing contact between vehicles on their property and the homestead," he said.

73s from Alistair

VK7 News

Justin Giles-Clark VK7TW

Divisional Council

Divisional Council met in Launceston on the 16th August 2003 and the following is a summary of the important issues dealt with:

- Council endorsed the proposal by the Southern Branch and Southern WICEN Executive to prepare a register of capability of amateurs willing to operate in emergency situations.
- Council received financial statements, branch reports from the South and North, together with comments by the Divisional education officer on the Federal proposals for amateur education for the future entry system to amateur radio.
- Council resolved unanimously to adopt the "Our Hobby of Amateur Radio" paper. Council resolved to make a paper copy or disc available to new members with their membership certificate, to make it available on disc to existing members on request, and to place it on the Divisional website at: www.wia.org.au/vk7 in PDF format.

Launceston Ham Receives Commendation

Barry Hill VK7BE of Riverside was awarded a special citation by Tasmanian Police Commander P.J. Edwards for his commitment as an independent person under the Youth Justice System Act 1997, for providing support to young people whilst in police custody. Congratulations Barry.

North West Beacons

All amateurs please note that as of Friday 5 October the following Amateur

Beacons located at Kelcy Tier are off air and out of service. The Beacons affected are those on 50.057, 144.474, 432.474 and 1296.470 MHz.

The reason for removal from service is that the property and site of the beacons has been sold and the Branch is actively looking for a new home.

On behalf of the North West Branch and all amateurs utilising the beacons, we take the opportunity of saying many thanks to Ron, VK7RN for providing his property and hosting the site for the Beacons over the last 10-15 years.

It is much appreciated as low cost sites for Repeaters & Beacons are becoming difficult to find these days. Thanks again Ron.

Branch Meetings

North

September's Northern Branch meeting was a lively discussion about the ACA's discussion paper on the review of the amateur service regulations. There was much concern expressed about some of the proposed changes and especially the "No Interference" policy proposal. There was also good discussion about the Foundation Licence proposal and definite support for the concept.

North West

We've got two new amateurs in our region - Congratulations to Rob Williams from Queenstown and Dion Bramich from the coast on passing their AOCP Theory and regs. We sincerely hope you have a great time in amateur radio.

South

Low Frequency Tests

Robert, VK7ZAL/AX2TAR has been conducting low frequency experimental transmissions test on 181.4 kHz. Robert transmits CW using one kilowatt into a 35 foot mast from his QTH in Moonah. The callsign used is AX2TAR. Skeds can be found on the VK7 Divisional Broadcast on a Sunday morning or on the internet version on the Divisional web page

Robert comments he can get a ground wave into Melbourne during the daytime and has worked two-way LF CW into New Zealand. He has also been heard in VK5. Robert hopes to receive reports from hams who hear his signal. Robert can be contacted QTRH.

Grote Reber

Our September meetings were something special. The following is a short summary of the talk given to the Southern Branch by Dr Raymond Haynes who has recently retired from the Australia Telescope National Facility of CSIRO and is a commentator on science on radio and television. He was chief author on "Explorers of the Southern Sky - The History of Australian Astronomy" published in 1996 by Cambridge University Press (UK).

Ray's talk was on "Grote Reber, the person (1911-2002)". Ray was Grote's only student during the early 1960s and did his honour's year experiment using Grote's Bothwell phased array for studying "Z mode echos" from the Ionosphere.

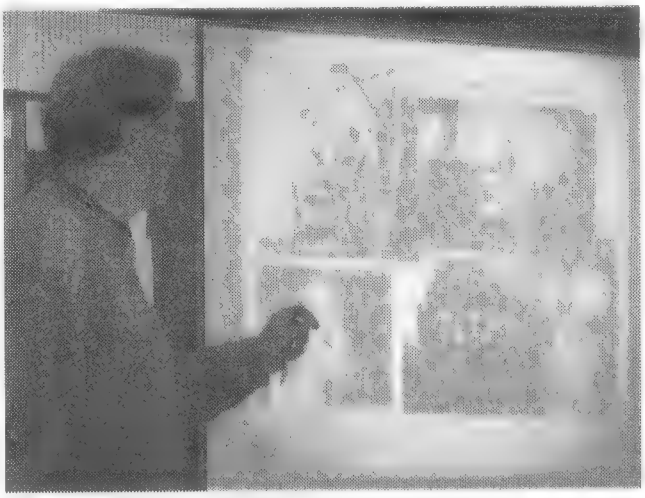
Grote was very bright and at 14-15-year-old he built a receiver and transmitter from scratch. He was self-taught, had one brother and a very dominant mother and was raised in a highly disciplined household. In 1938, Grote got a Diploma in Electrical Engineering and worked for the Radio Corporation building valve radios and this proved to be a good source of valves and components for his own experiments. He was dedicated to engineering science.

He was taken by an article in the NY Times on May 5, 1933 by Karl Jansky who was investigating how to overcome static for a transatlantic radio telephone service. Jansky experimented with planar arrays in the 20-100MHz range and repeatedly mapped the emission over a sidereal day and detected what was later realised to be the emissions from the Milky Way.

Grote was very interested in these experiments and wrote to universities to raise some interest in funding experimentation to no avail. This was the start of his cynicism about politicians and the scientific community and he decided to build his own antenna in his back yard in Wheaton, Illinois. This proved to be the first

Grote Reber

parabolic dish antenna ever made. It was 30ft in diameter, was steerable N-S and was made primarily of 4x2" hardwood. He designed and built the dish and the electronics. The frequency initially tried was 3300MHz, yes 3.3GHz and this meant that the surface of the dish that was fine chicken wire needed an accuracy of 1/8 of a wavelength! All valves ran on DC voltages. He designed the first DC-DC converters and this was all done for about $1,300. He observed nothing for 2-3 months and realised that he had to come down in frequency but feared that signals would be harder to detect. He was wrong and in fact the relationship was reversed and at 100MHz the passing milky way emitted the equivalent of 1 million degrees of black body non-thermal radiation. Grote then settled on 140 & 288 MHz. This antenna was used up until 1944 and was



Dr. Raymond Haynes presents his illustrated talk on Grote Reber, "the man", at the Southern Branch's afternoon and evening meeting.

relocated to the Greenbank Observatory, West Virginia as a Museum piece in 1994.

Grote had a fear of AC power creating noise and designed everything to use DC. This fear lasted his whole life and valves were the only devices that he built equipment with. He was never interested in transistors. During the war many radio physics labs and bright personnel were employed to develop radar to defend their respective countries and much research and development was done. In Australia after W.W.II these labs became the radio physics group of the CSIRO and in Raymond's words it was an exciting time to be in radio physics as discoveries were being made all the time. Grote's obsession with DC cost him a lot of money when he tried to setup a sea interferometer in Hawaii and the DC generator was unreliable.

At this stage many awards were flowing in for Grote from his original experiments in Wheaton. He lost more money and came to the conclusion that going up in frequency meant loosing more money so he decided to go down in frequency. Grote chose Tasmania as one of two optimum locations in the world to study radio astronomy where the ionospheric F0/F2 minimum penetration frequency reached a minimum in times of minimum solar activity (sunspots). He wrote to Bill Ellis at the ionosphere prediction lab in Tasmania in 1955 and they set-up two dipoles across a valley at Kempton and received the first emissions from space ever detected at a frequency of 980 kHz.

Some years later Grote searched for a valley with a flat floor to house his 1 MHz antenna and was not initially successful failing to find a big enough valley. So he settled on an observing frequency of 2.1 MHz and a smaller array. This was built north of the township of Bothwell. This was about a mile in diameter with 192 poles all 86 feet high. The array was fed by a Christmas tree feed so all dipoles were in phase with every other dipole and was steerable N-S. In Ray's word it was totally over engineered however this was Grote's way. He was primarily an engineer not a scientist.

Grote observed from 1961 to 1966 and built up a transit map at 2.1MHz. What Grote didn't realise, but was later explained in a paper by Bill Ellis and Fred Hoyle, was that the map showed that the Milky Way was totally in absorption proving that at low frequencies around 2MHz there is thermal absorption due to the presence of neutral hydrogen. Grote toured the world with the map and gained many ideas that he put into a paper but the paper was rejected due to the ideas not being correct. The paper ended up being published in an obscure journal called the Journal of Franklin Institute. The paper, poorly interpreted was almost completely ignored by the scientific establishment. The map did however demonstrate absorption by neutral hydrogen along the Milky Way.

Grote also played with genetics of beans and did many experiments on his Bothwell property. He created the first solar passive house complete with solar hot water transfer system that would heat a underground rock heat bank that would reverse heat the water that was circulated and heated the house at night. He designed a 3 wheel electric car as he hated the use of fossil fuels. He even spent time with Anthropologist Rhys Jones using carbon dating techniques to date Tasmanian Aboriginal artefacts. Grote just didn't get on with anyone, was a dogged fighter, wasn't prepared to listen to anyone who didn't have his view of the world and was anti-establishment but, his contribution to the science of early radio astronomy cannot be disputed.

He died in an Ouse nursing home on December 20, 2002 aged 90.

We thank Ray for giving us these talks, it was a fascinating insight into a very bright individual.

73, Justin Giles-Clark VK7TW

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Silent Key

Pat Geeves VK7GV

We were sorry to hear of the death of VK7's oldest amateur, Pat Geeves, VK7GV. Pat was 94 and active until just before his death. Pat was involved with the opening of the first Broadcasting station in Hobart in 1924, but Pat did not obtain his amateur licence until 1960. With a yachting background, high masts were no problem for Pat and he was soon making friends all over the world. At the age of 83 he bought a computer and set about writing his memoirs and using it with his amateur radio gear for slow scan television. Amongst the other tools in Pat's well equipped workshop was a small printing press and he produced QSL cards for many Hobart amateurs. Another of his interests was collecting old clocks and Richard, VK7RO remembers visiting him one day soon after he had spent a whole day winding them all up and setting them to the correct time. But of course some ran too fast and some too slow and within a week there were clocks chiming at odd times all over the house. He said that he would never do that again! Vale Pat.

ALARA

Christine Taylor VK5CTY
vk5cty@vk5cty or geencee@picknowl.com.au

The ALARA Contest

For most of us this was not a good year. There seemed to be very few YLs around, even on 80 metres. 80 metres was very noisy on Saturday but quite good on Sunday but it made no difference. During the daytime the bands were extraordinary quiet. It seems that those of us who were there were on at different times so we missed each other.

Disappointing all round. It is such a shame when this happens, as there is a certain amount of effort put in to run a contest.

Nevertheless, do put your logs in. This is the only way we can really assess what happened and decide whether there are changes we can make in the future.

A change to the VK3 Luncheons

Please note that due to the difficulty with the venue (remember that the usual one was closed earlier this year) and the small attendance numbers, the decision has been made to only hold the VK3 luncheons on the even months from now on. This means there will be no luncheon in November.

If you are intending to be in Melbourne, please do contact Bron VK3DYF or Gwen VK3DYL to confirm these arrangements.

The Remembrance Day Contest and the Lighthouse Stations

Conditions were much better for the Remembrance Day Contest so hopefully you enjoyed it. Remember to send in your logs for this contest, too.

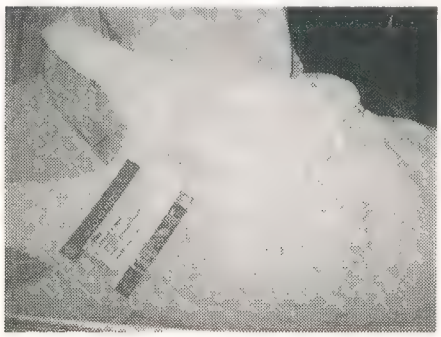
Did you contact any of the Lighthouse stations? These were operating over the same weekend as the Remembrance Day Contest and some stations were active in both fields. Do send those logs to the appropriate places so the organisers know how many people made contact and which lighthouses were manned.

We should encourage all special events if for no other reason than that they help us make use of the bands. We all know the old saying "Use it or Lose it!" We amateurs are decreasing in numbers and will be in danger of losing our privileges if we do not get on the air often enough.

It's Show time!

In many parts of the country springtime is the time for Agricultural Shows. Why not follow the example of some of us and enter your craft work? Recently Sue Mahony won a prize at the Gawler Show at her first entry. Now she is looking for some more local shows. It is fun to win a prize but it is even more fun to see your work on display. If you are there at the right time you will hear nice things said about it, too.

There is no doubt but that very many admiring remarks were made about the lingerie and sleepwear entered each year in the Royal Adelaide Show by Barbara VK3BYK. My admiration has been noted



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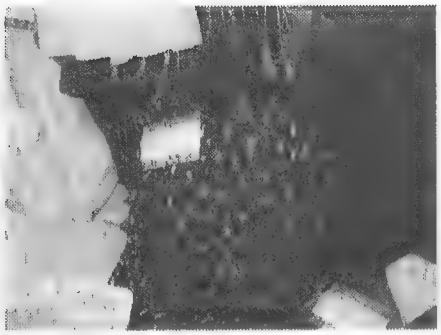
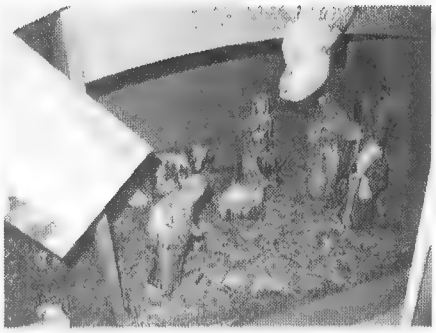
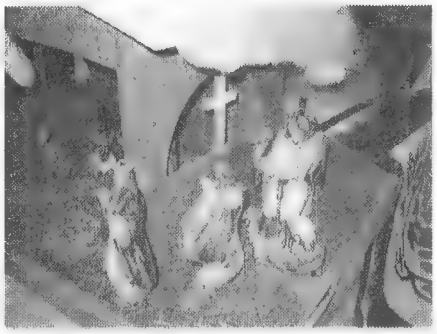






here for years. This year was no exception. Barbara won at least two first prizes and three second prizes for the items I saw. They are really lovely. I would love to own them but I would be afraid to spoil them by wearing them.

However, this year the very best YL entry was the beautiful Nativity Scene cross-stitched by Maria VK5BMT. All the figures are present, clustered around the cradle, all sewn in three dimensions. There is even a cloud hanging over the manger, done in cross-stitch. Awesome!!

Here are some photographs to give some idea of the beauty and high quality of both Barbara's and Maria's work. Congratulations from us all!!

This time it is the Indian Ocean

Following on their successful YL DXpeditions to Norfolk Island, Lord Howe Island and the Cook Islands, Gwen VK3DYL, June VK4SJ and Elizabeth VE7YL are heading to the Indian Ocean to Christmas Island and the Cocos Keeling Islands. They will operate from Christmas Island (IOTA OC-002) as VK9XYL from October 13-27, and from Cocos Keeling Island (IOTA OC-003) as VK9CYL from October 27-November 10

The XYL suffix for Christmas Island denotes an unrestricted licence as can be seen in the DXCC list.

QSL to VK3DYL as in QRZ.com

They will probably be able to access the YL 222 Net on Mondays from both locations so YLs will have an extra opportunity to find them on Mondays. They will possibly also operate on the ANZA Net mentioned in the September AR. This net is on Thursdays, Fridays, Saturdays and Sundays so it gives us even more chances to catch the DXpeditions.

October is JOTA month

Although we don't know them all, many YLs operate radio stations for JOTA. It is a great opportunity to show both boys and girls that amateur radio is a hobby for men and women. If we are asked to help this scouting activity we should do so if we can. There are many current amateurs who were introduced to amateur radio through JOTA.

We can be fairly sure Norma VK2AYL, Mary VK5AMD and Jeanne VK5OQ will all be helping at JOTA stations, but I am sure there are many more. Please listen out for them and any others, operated by YLs or OMs during the third weekend in October.

Please, ALARA members, if you are intending to participate in any amateur activity, let your publicity officer (and your newsletter editor) know and maybe even send us pictures. We can only tell others about it if you tell us.

Silent Key

Neil Gough VK2NG

We have been advised of the passing on Monday 15th September of Neil Gough VK2NG, formally of Lane Cove and recently of Gladesville. He is survived by his wife Molly.

Neil was a long time member of the WIA and had received a certificate of 70 years of membership.

Details of Neil's passing are to be found in Friday 19 September 2003 Sydney Morning Herald notices.

To his wife – Molly & their family our thoughts are with you at this time.

Vale Neil, VK2NG

Submitted by Ray Taylor via VK2 Division

Now is the time of the year for the 222 Net

At this time of the year the European stations are coming in much more often than usual. On a recent Monday stations from ZL, VE and the US were heard, as is the case for most of the year, but also there were two SM, two D and two M stations. WOW!

Sometimes we could hear them better than they could hear us, but there is usually someone to relay if necessary.

It is great to have June VK4SJ running the nets again. It cannot be easy but it is certainly one way to get your life back on track. Welcome back, June, from all your amateur radio friends.

Bill Magnusson VK3JT

Encouraging news on VUSAT

Nagesh VU2NUD recently reported on the latest developments regarding AMSAT-VU's forthcoming satellite, "VUSAT".

VUSAT is a 40kg micro-satellite to be launched onboard PSLV (Polar Satellite Launch Vehicle) from Sriharikota launch range. It will be a co-passenger along with another remote sensing satellite, most likely IRS-P6 to be launched on the same vehicle. VUSAT is cubical in structure of about 630 mm x 630 mm x 550 mm size. It has body-mounted solar panels on the four sides. Antennae for communication are mounted on the top, the bottom portion interfaces with the launcher. It will be spin stabilised and placed into a sun-synchronous polar orbit of about 917 km. The bus electronics performs the functions of attitude control, telemetry, telecommand and data acquisition and is controlled by a single microprocessor. Satellite Telecommand(TC) and Telemetry(TM) will be performed on the VHF band. There will be two transponders: Indian and Dutch which will fulfill main and redundant system roles. Both of them will be operating in Mode-UV configuration with UHF uplink and VHF downlink. They are linear transponders designated to operate in CW/USB/FM modes of amateur radio communication. Since they are linear transponders they may be tried in other modes of operation too. They will have an output power of about 1 watt. They will share common turnstile antennae for input and output along with satellite mainframe TC/TM systems. Typical link calculations are as follows:

UHF up link (435.25 MHz centre frequency)

Ground station power :	40 dBm (10 watt)
Antenna gain :	12 - 18 dBi
EIRP at max.ant.gain :	56 dBm

VHF down link (145.90 MHz centre frequency)

Antenna gain: 1	6 dBi
Received carrier power (at ground station)	107 dBm (1uV)

Notes: Both the transponders will have 60 kHz bandwidth. Transponders may be differentiated by their respective beacons; Indian transponder will have an unmodulated carrier on 145.940 MHz whereas the Dutch transponder will have modulated information on 145.860 MHz.

VUSAT will have a periodicity of about 7000 sec and is likely to be visible for about 10-12min maximum during a good pass. Flight versions of the transponders were tested "on-the-air" on 27 August 2003. Both the transponders worked satisfactorily in CW/SSB/FM of mode-B (UV) operation. Hams VU2LX, VU2POP, VU2IR, and VU2WMY/URC participated in this important test. With this testing the packages are ready to go on to the VUSAT deck. Up to date news and additional information is available at the AMSAT-India web site. http://www.amsat-india.org

The AMSAT group in Australia

The National Co-ordinator of AMSAT-VK is Graham Ratcliff VK5AGR. No formal application is necessary for membership and no membership fees apply. Graham maintains an email mailing list for breaking news and such things as software releases. Members use the AMSAT-Australia HF net as a forum.

AMSAT-Australia HF net

The net meets formally on the second Sunday evening of the month. In winter (end of March until the end of October) the net meets on 3.685 MHz at 1000 UTC with early check-ins at 0945 UTC. In summer (end of October until end of March) the net meets on 7.068 MHz at 0900 UTC with early check-ins at 0845 UTC. All communication regarding AMSAT-Australia matters can be addressed to:

AMSAT-VK,
9 Homer Rd,
Clarence Park, SA. 5034
Graham's email address is:
vk5agr@amsat.org

More precise antenna pointing with Yaesu/ Kenwood AZ/EL rotators

A year or so ago some-one made the suggestion that it would be desirable to devise a method of slowing down the speed of operation of the Yaesu/Kenwood AZ/EL rotators, particularly the azimuth rotator.

This was taken up by several people and it was soon realised that an additional advantage of slowing down the speed would be more precise pointing of the antennas. For most amateur radio applications the rotators have quite sufficient pointing accuracy but the slower movement was a desirable feature for those using larger VHF arrays. It sounded particularly attractive to Oscar operators using auto-tracking where the antenna system was being moved as frequently as every few seconds and often in small increments. Antenna sway can become a problem. I have watched, apprehensively, as my own 145/435 MHz auto-track system oscillates back and forth when the whole structure sometimes gets itself into mechanical resonance with the tracking pulses. Fortunately this situation only lasts for a few seconds at a time. But I can remember thinking as I watched that a slower rotation rate might help. Michael, DB6NT described a design to achieve this in VHF Communications Q2 - 2002 pg 66-68. It uses pulse motor control and a semiconductor relay. You can see it in his catalogue available at: http://www.kuhne-electronic.de/. I have placed this project on my wish list and hopefully it will come to the top one of these days. The Kuhne web site is worth a visit anyway. It contains heaps of good information on everything VHF/UHF and a good sprinkling of satellite gear too. Catalogues are downloadable although rather large. The pricelist indicates that the PCB for the rotator slowing project is available at very reasonable cost. The kit is also available from "VHF Communication" magazine. See www.vhfcomm.co.uk for details. "VHF Comms" is a great specialist magazine with a long established and well earned reputation. It is a feast of information relevant to AMSATers. These web sites will certainly whet your appetite.

Birthday Celebrations for AO-40

A third anniversary celebration of the launch of amateur radio satellite AO-40 is planned for 16th and 17th November 2003.

AO-40 was launched on 16th November 2000. AMSAT is encouraging as many amateurs as possible to operate on AO-40 on the above dates to help celebrate AO-40's third birthday. AO-40 has been providing some of the best satellite operation ever for those who are equipped with 70 cm or 23 cm transmit and 13 cm receiving gear. Please give some thought to getting up and running on this wonderful bird. It's not as difficult as many people imagine. Small antennas, low power requirements and heaps of international activity make AO-40 operation a pleasure. Remember too that AO-40 is a high altitude satellite. At apogee it moves very slowly across the sky. It is quite possible to hand-aim your antennas in this situation. Many operators have their entire antenna array mounted on a tripod. The array can be aimed for best receive signal and will only occasionally require re-aiming during a QSO. There's plenty of help available on the AMSAT-NA web site and via the AMSAT e-mail bulletin board. Lots of VK amateurs are already enjoying regular AO-40 QSOs. There is even a large following of "DX" operators who look for new call areas or zones or prefixes - even IOTA (Islands On The Air), DXpeditions and events like Lighthouse weekends seem to be exciting more and more interest world wide. Do try to work AO-40 on the 16-17 November and help swell the ranks of VKs celebrating its third birthday.

AO-40 3-axis Stabilisation

Plans to implement 3-axis stabilisation of AO-40 have been put on hold for the time being.

Every now and then the question comes up "When is AO-40 going to be put into 3-axis mode?" AO-40 is at present spin stabilised. That is to say the spacecraft spins slowly on its axis like most OSCARs and this results in widely varying 'squint' angles during each orbit. The orientation is 'juggled' by the control stations to give the best possible 'squint angles' for this type of stabilisation and take into account eclipses and the effects of solar cell illumination on the power budget. This stabilisation system has proved very workable and has served us well with the early days of AO-10 and AO-13. AO-40 is the first OSCAR to carry a means of 3-axis stabilisation using momentum wheels. Some time ago the system was given a short test run and proved OK. However ...the full deployment of 3-axis stabilisation is tied in with the final unfurling of the solar panel arrays and exposure of the HF antenna system. These last two operations are non-reversible. It has been decided that the process is too sensitive to risk at present while AO-40 is the only high orbiting amateur radio satellite in reliable operation. It will remain spin stabilised until such time as Phase-3E becomes a reality. This way, even if something unthinkable happens during deployment of the 3-axis system, all will not be lost.

Latest Happenings on UO-22

Following up on last month's report of the possible return of UO-22, I made contact with Rob VK3KOS - another regular - and we set up a listening watch. Sure enough UO-22 did return as Chris G7UPN had promised. The signal was strong, at times very strong but it was not constant. In its heyday UO-22 provided the strongest and most constant down-link signal of any amateur satellite I'd ever encountered. Since its return though, UO-22's strength varied during each pass indicating that all may not be well with the stabilisation. The up-link was closed for some days after the return, as was the BBS. Then suddenly UO-22 appeared to be working as normal. The BBS was open and I was easily able to up-link messages to Chris and the Surrey gang, and of course to Rob. Lots of activity started to appear and the usual batch of automated packet sat-gate stations were still there. It was encouraging to see UO-22 working even when close to eclipse. Since then Chris reported that the satellite had again been switched off except when in range of the ground station. The controllers were sorting out the scheduling of available power between attitude control and transmitter operations. This announcement tallied with our observations regarding signal variations. As this column is being written UO-22 appears to be back to normal - except during eclipse periods. The BBS is operating and the usual flurry of messages is again evident. Looks like a lot of people were waiting for the return of this popular satellite. UO-22 is the last of the original batch of 9600 baud 'store-and-forward' birds. It has served us well. Thank you to Chris and the gang at Surrey for their work in giving us back this satellite. More information on UO-22 and all the University of Surrey activities is available on their web-site. http://www.sstl.co.uk/

Silent Key

Ron Reynolds VK2AFR

We have just been advised of the passing last Monday evening of Ron Reynolds VK2AFR of Westmead.

His funeral was conducted at Pinegrove last Tuesday 2nd September 2003 .

He was in his 90th year. Ron was a long time member of the WIA.

Submitted by Ray Taylor

Ron Smith VK4AGS
Federal Education Co-ordinator

Project the Future

The future

There is much interesting discussion about the future of amateur radio in Australia. This gives an excellent opportunity to think seriously about upgrading the education and assessment system that is used. When you look at educational history we are actually using educational methods from about fifty years ago, although we were late starters. Much has happened in education over the years and there are far more modern and much better educational methods now available. If we are looking to the future we really should not be dwelling in the distant past.

Ahead of the world

Around the world at the moment, *Project or Problem Based Learning (PBL)* is leading quality education. I am indeed fortunate to actually do my real professional work where an international delegation told us not so long ago that we were not the best in the world, but rather that we were the target the best were trying to catch up with. We were just so far ahead!

Be careful

Some readers like to search academic literature and web sites. PBL in its modern, and by far the best, implementations is developing so quickly that any references more than about two or three years old are substantially out of date. Another warning to readers is that some literature actually makes a distinction between Problem Based Learning and Project Based Learning. This distinction is artificial and not really necessary when really good PBL is looked at.

Open the thinking mind

While on the subject of warnings, be warned that to appreciate PBL you need to be a good observer of learning and be open-minded enough to make the paradigm shift needed in educational thinking to implement it well. If you do not make this shift, then you only do an acceptable educational job, rather than a high quality job. Where I work has been there and done that. We have made the mistakes but have moved on past them with great success.

The project

Simply PBL is where learning is done by completing a project, or projects. This is not an assignment or even a science, mathematics, or technology problem to solve. The project is the learning environment. It is not the learning. It is the environment. The full realisation of this is just so fundamental to the successful implementation of PBL.

There are many implications of having the project as the learning environment. The success or failure of the project is irrelevant to the success of learning. The project has to meet certain minimum requirements to ensure enough learning has taken place but the project does not have to 'work'.

A beginner's trap

It follows on that the results of the project are not assessed. The report on the project is not 'marked'. This is the mistake we made initially. It is interesting that whilst reading recently some research done by another Australian university into PBL in engineering in the past year or so that they reached a conclusion that it was a very successful learning approach. They however, assessed the projects. If they had really appreciated the full implications of the projects as the learning environment then the learning results would have be just so much more spectacular. It is just so easy to fall into this trap. It is when the projects are not assessed that PBL really shines.

Widescreen multi-channel

Another feature is that the projects are holistic and not specific. There is no need for all students to do the same projects. However, the range of projects a particular student actually attempts provides more than ample opportunities to meet all the learning outcomes and reach the appropriate standards. In the amateur radio context any single project is likely to involve a combination of electronics, regulation, safety, and operation. By good project design it is just so easy to meet more than adequately our ITU obligations regarding knowledge and skills for amateur operators.

Learning outcomes – know your target

You can almost guess the next step. PBL is impossible without clear specifications of the learning outcomes expected and the standards to be reached for success. The current approach we have in amateur radio of having a syllabus which is essentially a list of topics with the standard hidden in sample questions is not good enough. Although having foundations much earlier, this approach was certainly common educational practice thirty years ago. Education has moved well past this, although some parts still cling to the past. There is a pressing need to have our syllabi in education terms for the twenty-first century.

Learning in 21st century

Any education can only be successful if best aspects of educational psychology are applied. Research in this area in the past twenty years has focussed on the behaviour of students in different learning environments. One of the key findings which fits PBL better than any other method is the quality, life long, authentic learning best takes place in a collaborative environment.

Assessment

A begging question then is how is quality PBL assessed? There is nothing in the PBL concept that argues that traditional assessment methods, eg exams, should not be used. However, experience around the world amongst the world

leaders in PBL shows that using traditional, after the event, assessment methods actually limits the quality of learning quite substantially. The best implementations actually include assessment as part of the learning.

There are a few different implementations but the world leaders use a system something along these lines. There are published learning outcomes and standards. Students work collaboratively on the agreed projects with the assistance of a facilitator. As the students work on the projects they look to the learning outcomes and standards to keep on track. Students keep records of their learning. Some examples include a journal or a workbook. Some implementations actually have some specific questions to be answered along the way. At the end students make a submission claiming they have been successful in meeting the outcomes at an appropriate standard and produce evidence of this. In some implementations students in a team also write grade assessment of their peers, again producing evidence. Claiming success is not enough. Evidence is needed.

The cheats

Every assessment system concerns itself with ensuring it is "the student's own work". In places, including the current amateur radio system in Australia, there are organisationally complex, costly, and slow systems in place. Under best PBL practice security is easy, as the whole process is open. Dishonest practices cannot hide and are easily seen. There is no need for elaborate procedures.

Accuracy

Another pressing question is accuracy of assessment, particularly in a student driven assessment process instead of a system driven assessment process. Is a pass a genuine pass? Under the best style of PBL accuracy is far higher than exams. If you look at the history of exams, going back about a century in Australia, you will find exams are not very accurate as indicators of individual student learning, although they are quite good at ranking average performances of groups. The best evidence I can cite for accuracy is experience where I work. We have done some research and made comparisons with future learning success of our students in later years of study. We have used both our old system before PBL, and our PBL claiming the grade system. The correlation between PBL and future success is very high, far, far higher than the correlation with traditional assessments.

The accuracy is not dependent on the opinion of the student alone. The facilitator who has been working with the students has the role of validating the claim of grade. Usually those students heading for a fail are identified early and guided to improve their learning. This is true learning. It is too hard to be dishonest here. Overarching is a moderation process. This is usually a review by facilitator peers. Again since marginal pass/fail, ie the 68% or 70% students in the current system are rare the moderation process is relative easy. Successful grades are easily confirmed, as there is usually more than substantial evidence.

That's almost all

While it is possible to fill this magazine many times with the features of PBL as implemented in the world's best practice, this short summary should give you some ideas to focus on. I am unashamedly fully supportive of world's best practice in PBL. I see it in practice every working day. When I conduct seminars in PBL for professional educators they are highly supportive. It is a different but exciting learning environment to be part of.

Next time I will outline a simple PBL project which could well be one of say four suitable for a beginner's level licence in amateur radio.

They blew my socks off

I am writing this a few days after watching some local Year 11 students working with local scientists and engineers from industry and university as facilitators on some PBL tasks. There was no assessment in this case as no award was involved. They reported their activities which lasted three days using multi-media to a large audience that filled a five hundred seat lecture theatre, consisting of parents, professionals, their teachers, the media, and the general population. It was easy to see that they had learnt just so much. The quality was something to be admired. I could not help but think PBL leading to a beginner's level licence would fit wonderfully into this scene of scientific and technological challenge. I could also see how traditional teaching and assessment would totally destroy the quality of the three days.

ar

Over to you

"Marconi's Magic Box"

I've just read a most interesting book entitled "Marconi's Magic Box" which I recommend to all Hams! It's the story of Wireless and the remarkable man who invented it! As the book's jacket states,

"On a winter evening in the East End of London in 1896, an unassuming young Italian gave the first public demonstration of a device he had created in the attic of his family home near Bologna.

It consisted of two wooden boxes, one of which could apparently transmit messages to the other. Many of those in the audience suspected that they were witnessing a mere conjuring trick. None of that audience could have guessed that Signor Marconi's magic box would be regarded as the most remarkable invention of the nineteenth century".

This hard cover publication is full of facts to keep the reader interested. As well as a story of a remarkable amateur radio inventor, it is the history of the colourful early days of wireless. The author, Gavin Weightman, is a professional writer and filmmaker. A Harper-Collins publication with an ISBN 0-00 713005-8

73 Max Morris VK3 GMM

Contests October - December 2003

Oct	4/5	Oceania DX Contest (SSB)	(Sep 03)
Oct	4/5	TARA PSK Rumble	(Oct 03)
Oct	5	RSGB 21/28 MHz Contest (SSB)	
Oct	11/12	Oceania DX Contest (CW)	(Sep 03)
Oct	18/19	JARTS WW RTTY Contests	
Oct	18/19	Worked All Germany Contest (CW/SSB)	
Oct	19	RSGB 21/28 MHz Contest (CW)	
Oct	25/26	CQ WW DX Contest (SSB)	
Oct	25/26	CQ WW SWL Challenge	
Nov	1/2	Spring VHF+ Field Day (CW/SSB/FM)	(Oct 03)
Nov	3	High Speed Club Contests (CW)	
Nov	2/3	Ukrainian Contest (CW/SSWB/RTTY)	
Nov	9/10	OK/OM DX Contest (CW)	
Nov	16/17	LZ DX COntest (CW)	
Nov	23/24	CQ WW DX Contest (CW)	
Nov	23/24	CQ WW SWL Challenge (CW)	
Dec	5/7	ARRL 160 Metres Contest (CW)	
Dec	6/7	MDXA PSK31 DeathMatch (PSK31)	
Dec	6/7	TARA RTTY Sprint	
Dec	13/14	ARRL 10 Metres Contest (CW/SSB)	
Dec	20	OK DX RTTY Contest	
Dec	20/21	International Naval Activity (CW/SSB)	
Dec	26	Ross Hull Memorial VHF Contest (CW/SSB/FM) (Nov 03) *(—to 11 January, 2004)*	
Dec	27/28	Original QRP Contest (CW)	
Dec	27/28	Stew Perry 160 Metres Distance Challenge (CW)	

Results CQ/RJ WW RTTY DX Contest 2002

VK/ZL only

Call	Category	Score
ZL2AMI	SOABHP	1,174,057
ZL3JT	SOABLP	448,200
HS0/VK3DXI	"	29,250
VK5LA	SO 15 metre	29,841
VK6GOM	SO assisted	750,774

Rules PSK Rumble sponsored by Troy ARA

Saturday, October 4th, 2003. 0000z - 2400z PSK only. 80, 40, 20, 15, 10, 6 metre.

Work stations once per band. Exchange name, state/province/DX send dxcc prefix. Operate 1 of 5 categories:*Normal* 100 W max.; *Great*,20 W max.; *Super* 5 W max.; Novice or SWL.

Final score is QSOs (W + VE + JA + VK call areas + 1 point per DX incl. your own). Mults. count once per band. To be valid, scores must be received via our online score submission form found at "http://www.n2ty.org/seasons/tara_rumble_score.html" or email.

Check-Logs to *rumble-manager@n2ty.org* by the last entry date 1st. November 2003. Logs must be available for review if requested. Please read web rules for details on "http://www.n2ty.org/seasons/tara_rumble_rules.html"

Rules – Spring VHF-UHF Field Day 2003

From John Martin (VK3KWA), Contest Manager

1/2 November, 2003

0100UTC Sat. - 0100UTC Sun.

The Spring VHF-UHF Field Day will take place on the weekend of November 1 and 2, 2003. Logs will be due on November 24 and entrants are also invited to include any comments or suggestions about the rules.

Dates: Saturday and Sunday November 1 and 2, 2003.

Duration in all call areas other than VK6:

0100 UTC Saturday to 0100 UTC Sunday.

Duration in VK6 only:

0400 UTC Saturday to 0400 UTC Sunday.

Sections

A: Portable station, single operator, 24 hours.
B: Portable station, single operator, 6 hours.
C: Portable station, multiple operator, 24 hours.
D: Portable station, multiple operator, 6 hours.
E: Home station, 24 hours.

Single operator stations may enter both Section A and Section B. If the winner of Section A has also entered Section B, his log will be excluded from Section B. The same applies to the winner of Section C if the station has also entered Section D.

General Rules

A station is portable only if all of its equipment is transported to a place which is not the normal location of any amateur station. Operation may be from any location, or from more than one location. You may work stations within your own locator square. Repeater, satellite and crossband contacts are not permitted.

One callsign per station. If two operators set up a joint station with shared equipment, they may choose to enter Section A or B as separate stations under their own callsigns, or Section C or D under a single callsign. If they enter Section A or B, they may not claim contacts with each other. Stations with more than two operators must enter Section C or D. Operators of stations in Section C or D may not make any contest exchanges using callsigns other than the club or group callsign.

No contest operation is allowed below 50.150 MHz. Recognised DX calling frequencies must not be used for any contest activity. Suggested procedure is to call on +0.150 on each band, and QSY up if necessary.

Contest Exchange

RS(T) reports, a serial number and your four digit Maidenhead locator.

Repeat Contacts

Stations may be worked again on each band after three hours. If the station is moved to a new location in a different locator square, repeat contacts may be made immediately. If the station moves back into the previous locator square, the three hour limit still applies to stations worked from that square.

Scoring

For each band, score 10 points for each locator square in which your station operates, plus 10 points for each locator square worked, plus 1 point per contact. Multiply the total by the band multiplier as follows:

6 m	2 m	70 cm	23 cm	Higher
x 1	x 3	x 5	x 8	x 10

Then total the scores for all bands.

Logs

Logs should cover the entire operating period and include the following for each contact: UTC time, frequency, station worked, serial numbers and locator numbers exchanged, points claimed.

Cover Sheet

The cover sheet should contain the names and callsigns of all operators; postal address; station location and Maidenhead locator; the section(s) entered; the scoring table; and a signed declaration that the contest manager's decision will be accepted as final.

Please use the following format for your scoring table. In this example the operator has operated from one locator and worked four locators on each band:

Band	Locators + Activated (10 points each)		Locators + Worked (10 points each)		QSOs x (1 point each)		Multiplier	=	Band Total
6 m	10	+	40	+	40	x	1	=	90
2 m	10	+	40	+	30	x	3	=	240
70 cm	10	+	40	+	20	x	5	=	350
					Overall Total			=	680

A sample cover sheet has been posted on the VK-VHF e-mail reflector, and copies can also be obtained from the e-mail address given below.

Entries

Paper logs may be posted to the Manager, VHF-UHF Field Day, 3 Vernal Avenue, Mitcham, Vic 3132. Electronic logs can be e-mailed to jmartin@xcel.net.au. The following log formats are acceptable: ASCII text, MS Office RTF, DOC, XLS or MDB. If you use Office 2000, please save the files in Office 97 format.

Logs must be received by Monday, November 24, 2003. Early logs would be appreciated.

ar

Over to you

More info please!

Some of us oldies and/or computer illiterates are griping about the fact that we are increasingly being kept in the dark regarding new products and developments re Ham Radio! The Call-Book contains nothing more than our Call Signs. The last Call-Book to provide us with repeater frequencies etc was back in the year 2000. In essence it was a YearBook! Many of us are paying top dollars to buy the British monthly magazine Practical Wireless, just to see what is happening with new gear! With only A.R. available, we are increasingly reliant on this publication to keep with the latest. So, how about including Repeater Listings, TV frequencies, Beacons, C.B. frequencies and so on. Information such as this need only be printed, say twice a year! And while on the soapbox, we need advertisers of the latest in equipment available in this country. Sales are being lost due to a lack of adverts in A.R.

M. Morris, VK 3GMM, VK3AWM, QTHR

Adelaide Hills Amateur Radio Society

The October meeting of AHARS drew a large crowd. The topic, refilling cartridges for your inkjet printer, is one that causes many discussions.

The speaker is an expert in the field and had many interesting stories to tell.

He does not recommend doing the refills yourself, in most cases, because the refill ink generally available is inferior. However he says there are no cartridges that cannot be refilled.

There are certainly many traps put there by the manufacturers to stop anyone refilling your cartridges but the experts are constantly working to overcome these barriers.

Do not believe your printer repairer when he tells you that you have voided your guarantee by having the cartridges refilled. This is against the law. If you ask for this voiding rule to be put in writing your will find the repairer backing down.

Remember, printers are very cheap. Cartridges are expensive. That is the way the manufacturers make their money. Make your cartridges last as long as possible by having them refilled by an expert.

Anyone visiting Adelaide is welcome to come to an AHARS meeting. Contact Geoff VK5TY or Paul VK5PH for information about the forthcoming topic. The meetings are held at the Blackwood High School at 7.30pm on the 3rd Thursday of the month

Southern Group Luncheon

The October luncheon was very well attended with some new faces. Trevor VK5ATW and Helen and John VK5JR from Mount Gambier, also with his lady, were present for the first time.

As usual the company was pleasant and the food good. After the lunch most of us had coffee at the QTH of Garry VK5ZK and Cecily. Garry's shack was given a good inspection after its recent modification. The view over the river there is magnificent.

All in all a pleasant outing with pleasant people.

Push Button Memory Antenna Adjustor

A simple way to make a dipole wire antenna adjustable to a number of bands appeared in the *Hints and Kinks* column of Bob Schetgen KU7G in *QST*, April 2003. The idea came from Terry Schieler W0FM who had the idea to use cord stoppers to hold the excess wire folded back along the dipole in the adjustment process. The cord stoppers are the spring loaded barrel devices commonly used to hold drawstrings on clothing or travel goods. They are available relatively cheaply from sewing supplies shops and from travel and outdoors suppliers.

The end of the adjustable dipole is shown in Fig 4. The wire used in the original was flexweave antenna wire but a multi strand wire should be suitable. The main requirement is for the wire to be similar in size and flexibility to the cords which the stoppers are designed to work with. The antenna should be built for the lowest frequency of interest. Then the wire can be folded back along the dipole to produce dipoles on higher frequencies. The band positions can be marked to allow speedy retuning. In the field the antenna can be fine tuned by adjusting the length for best operation which allows you to compensate for the different situations a portable antenna is set up in. Terry W0FM used the antenna on 20-17-15-12-10 metre when on vacation. The antenna can be light and easy to setup and adjust.

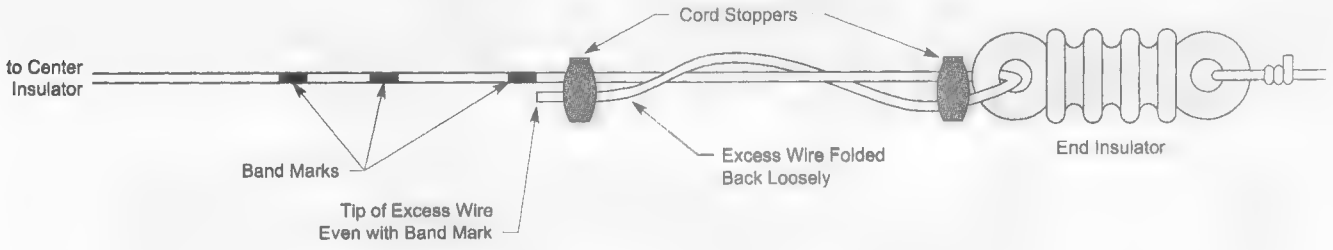


Fig 4. W0FM's push button tuned antenna.

Ham Shack Computers

Alan Gibbs VK6PG
223 Crimea Street, NORANDA WA 6062
Email: vk6pg@tpg.com.au

Part 30

Icom IC-Q7 Tweaking

It's amazing how much technology can be bought for the Aussie Dollar these days. The spin-offs extend into the fields of Amateur Radio in the shape of digital technologies, surface mounted components, and mass circuit integration significantly reducing the size of completed items. Hand-held receivers and transceivers are now manufactured with a myriad of options from the key players like Alinco, Icom, Kenwood and Yaesu. Multi-band handheld transceivers covering 6 metres through 23 centimetres, with up to five watt output on transmit, and receiving capabilities that extend from 100 kHz to 3G Hz - AND about 1,000 memory channels. Add other options like 25/12.5 channel spacing, CTCSS, DTMF, pocket beep, 1,750 Hz tone burst, TV channel selection (with pictures in colour!), FM broadcasting - the list seems endless. These devices can not only be purchased to MIL specs, are waterproof, fit in the palm of your hand, run off two AA cells - BUT the total size is less than a mobile phone!

On the down-side, these "handies" are so small it becomes difficult to operate and program because of the multi-function, tiny buttons and miniature liquid crystal displays that are impossible to read when wearing Polaroid sunglasses! Fortunately, most of these devices are computer programmable.

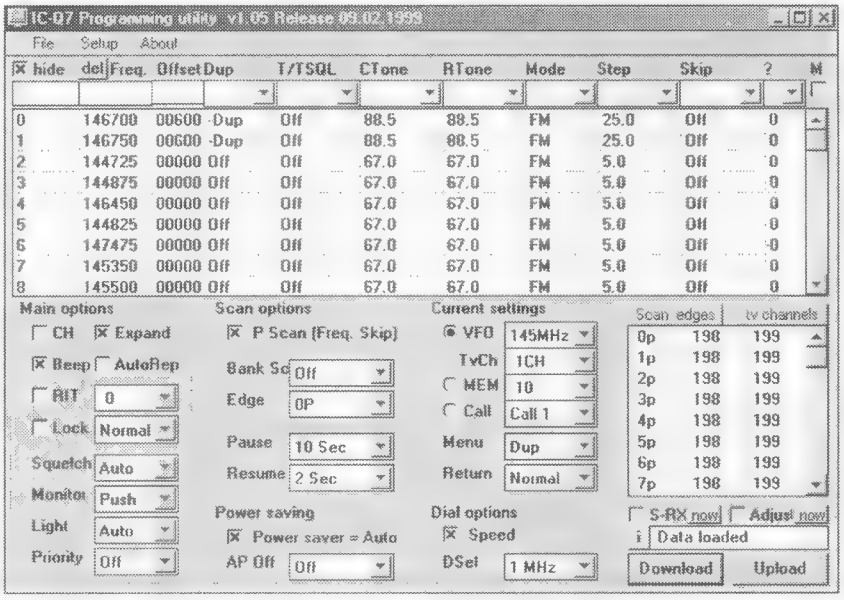
Lets assume you are going to the UK (New Zealand, the USA or wherever) on holiday and you'd like to program all your favourite Australian channels PLUS all the key channels needed while on holiday. Trying to dump all that little lot into memory (without errors) can take weeks of fumbling around with the little buttons. Most modern "handies" are computer programmable making the task easy. The hard part is collecting the list of all the channels you want to access, both at home and on holiday, before the programming starts.

The RSGB, NZART and the ARRL all have web sites where the channelling and locations can be listed. Once done you are ready to start programming the "handie" the EASY WAY.

Icom IC-Q7A/E

Whilst the Icom IC-Q7 is an early example of our selected "handie", it reveals most of the ethos of this article. The device comes in two types:

1. US version (IC-Q7A) covering 144-148 MHz on 2 metre, and...
2. UK version (IC-Q7E) limited to 144-146 MHz and not much good in VK-land or the USA!


IC-Q7 Programming (UK) V1.05 Release 03.02.1958
File Setup About
hide del Freq. Offset Dup T/TSQL CTone RTone Mode Step Skip ? M
0 146700 00600 -Dup Off 88.5 88.5 FM 25.0 Off 0
1 146750 00600 -Dup Off 88.5 88.5 FM 25.0 Off 0
2 144725 00000 Off Off 67.0 67.0 FM 5.0 Off 0
3 144875 00000 Off Off 67.0 67.0 FM 5.0 Off 0
4 146450 00000 Off Off 67.0 67.0 FM 5.0 Off 0
5 144825 00000 Off Off 67.0 67.0 FM 5.0 Off 0
6 147475 00000 Off Off 67.0 67.0 FM 5.0 Off 0
7 145350 00000 Off Off 67.0 67.0 FM 5.0 Off 0
8 145500 00000 Off Off 67.0 67.0 FM 5.0 Off 0
Main options
CH Expand
Beep AutoRep
RIT 0
Lock Normal
Squelch Auto
Monitor Push
Light Auto
Priority Off
Scan options
P Scan (Freq. Skip)
Bank Sc Off
Edge 0P
Pause 10 Sec
Resume 2 Sec
Power saving
Power saver = Auto
AP Off Off
Current settings
VFO 145MHz
TyCh 1CH
MEM 10
Call Call 1
Menu Dup
Return Normal
Dial options
Speed
DSel 1 MHz
Scan edges
tv channels
0p 198 199
1p 198 199
2p 198 199
3p 198 199
4p 198 199
5p 198 199
6p 198 199
7p 198 199
S-RX now
Adjust now
Data loaded
Download
Upload

The computer is connected via the headphone/microphone socket on the top of the transceiver. The socket uses three contacts, one for the mic/headset, another for PTT and the last for communication port access. None of this is detailed in the Icom handbook! The truth being that the IC-Q7 is actually an Icom R5 receiver with a multi-band transmitter added. Icom don't tell you this either!

Programming the Handie

Like most AR rigs these days, all the software is available in the Internet - and it's free. If your AR retailer stocks proprietary software, it's usually expensive, so use the Internet.

The Digital Laboratory, by Goran Valaski (2) has all the software (and hardware) for Icom, Kenwood, Yaesu, Alinco, AOR. and others at competitive prices. The IC-Q7 software is free.

The interface for the Icom IC-Q7 is a bi-directional TTL to RS232 converter built inside a DB-9 com-port plug, and constructed on a tiny PCB with surface mounted components. However, these can be easily constructed with conventional components from the extensive number of circuits previously described in this publication. Icom don't advertise these items but your dealer might be able to help if you are not into constructional projects.

Version 1.05 of the Icom IC-Q7A/E software was released in 1999 yet still remains a powerful option for programming your "handie". The illustration shown on the previous page offers just about every feature you'd wish for in such a tiny rig. Start at 0 (the first entry) and work through each channel one by one from the channel data listed from your research. Note that different countries use differing parameters like channel spacing from 25 kHz through to 12.5 kHz on some UK repeaters. Tone squelch, CTCSS, mode and the likes are entered as required. Once a few entries have been made, the file is saved to your computer with the file extension as .Q7. The writer has saved the file as ADJ-6PG.Q7 and other files now exist for the UK and US calling and working channels.

The clone option

Setup only requires the com-port to be identified so that your computer can "talk to" your transceiver. Once done, click on Upload (bottom right hand corner of the screen). You should see the data being loaded into the memory of the "handie". Pull out the clone cable from the top of the transceiver and select the first memory channel – it should coincide with your entry, and your handie should work as required. Add more channels to the computer interface, and include divisions for 6 metre, 2 metre, 70 centimetre and 23 centimetre. Upload as often as you like to include new channels and to update the "handie".

Add special calling channels, regular repeaters, simplex local chat channels and the likes. Remember you can include FM broadcast stations, AM aircraft frequencies and television channels that are outside the transmit limits of the handie. So, next time you fly out on your international holiday, you'll be able to hear the flight instruction from the control tower, and the responding chatter from the Jumbo pilot including the QNH and QFE, Hi

With 200 channels in the Icom handie, the problem will be to remember which is which! Some more modern handies are now sporting 1,000 channels or more. It's enough to drive any assertive RA nuts trying to find a useful working channel from memory! However, the scanning options in the software might be for you, or you might want to listen to the local FM news whilst in bed.

There are so many uses for handies these days. The writer took his to the UK, with the entire UK channels pre-programmed before leaving Perth. In addition an Icom IC2000H mobile rig and mag-mount antenna were stored inside the hand luggage. On landing at Heathrow, a hire car was fitted with the IC2000A with BIG crock clips clamped to the battery and the mag-mount 5/8-wave whip dumped on the roof. With the two rigs (mobile and handie) the holiday was magnificent. Rallies became a dream, friends were located, talk-in stations abounded, and when visiting old mates - the ultimate talk-ins were a delight.

Other options

Climbing towers with a handie makes life easy. Being able to talk to your mate on the ground is essential. Beam direction settings, spanner sizes, wind problems, gin poles, clamps, feeder and rotator connections and other instructions can be relayed to the ground crew without bawling into a megaphone and announcing to the neighbours that they are in for trouble with the new installation! Even on holiday, leave the XYL in the car while you go looking for something or someone. However, when you do this, don't use a National FM Calling Channel to upset the natives!

A Big Secret!

The writer mentioned that the Icom IC-Q7 was based upon the Icom R7 receiver. Indeed, the IC-Q7 innards has the capacity to extend the receive capability down to 100 kHz covering the entire HF spectrum. Not only can you listen to short wave and AM broadcast stations, just think how useful this can be on holiday! Also, use your handie as a faultfinder, TVI locater, and excellent for running tests with friendly co-operative neighbours minimising any strife that might lead to stalemate situations. To extend your IC-Q7 for full HF coverage, just select the little S-RX check box on the lower right of the screen, then Upload again and Save to a new file. Starting with a pre-programmed handie, try the Download button to retrieve settings from the handie - many of the other options are at your fingertips.

Summary

A light-hearted approach to programming a hand held transceiver (HT) has been discussed, but there are many users with other makes and models, most of which can be enjoyed in a similar manner. If you are curious then look to The Digital Laboratory (2) for starters. Links are available on the Ham Shack Computer Web Site (1) including the popular HSC CD with all the articles and software in this series. In brief, if you can't program it, flog it at the best price and get a new programmable rig!

Ham Tip No. 30.

If you are considering buying a new receiver or transceiver, NEVER buy one that cannot be computer programmed or controlled. Even if you don't want these facilities personally, it will maintain the value of your new rig should you decide to trade-in later on.

Ham Shack Computers, Part 31 next month- discusses "Internet Trading" for Radio Amateurs. A controversial topic that might get local dealers fidgeting in this country, but with distinct advantages for progressive AR operators.

(1) Ham Shack Computers Web:
www2.tpg.com.au/users/vk6pg
(2) The Digital Laboratory at
http://www.digital-laboratory.de/

73's de Alan, VK6PG/G3PHG

Last summer Amateur Radio operators were invaluable in bushfire communications

(see March AR)

The community needs hams

Join your local WICEN group today

VHF/UHF – An Expanding World

David Smith VK3HZ – vk3hz@wia.org.au
Leigh Rainbird VK2KRR – vk2krr@telstra.com

Weak Signal

Spring is here and the mind turns to ... Field Days of course (what were you thinking?). The first, and usually best attended, of the VHF/UHF field days is the Spring VHF/UHF Field Day over the weekend of November 1 & 2 this year. Last year, according to the logs submitted by participating stations, a large contingent of VK3 stations participated, but very few from the other states. For example, on 2 m, 76 different VK3 stations were logged, whereas only 15 VK5, 9 VK2, 8 VK4, 6 VK7 and 2 VK1 stations participated. On 23 cm, there were 20 VK3 stations, 2 from VK7 but none from any other states. No VK6 stations were logged on any bands. So, let's get some activity going. Dust off that portable setup, find yourself a mountaintop and plan to be out, at least on the Saturday afternoon. Tell everyone where you plan to be via the VK-VHF mail list both to avoid unplanned multi-op siting and to encourage others to participate. You're sure to find other stations to work.

Those who have home-brewed VHF/UHF gear and even those who have delved into the innards of commercial VHF/UHF gear have no doubt come across the Mitsubishi series of RF Power Modules (e.g. M57762). These provide an easy and convenient, although not so cheap, means of obtaining power on 2 m, 70 cm and 23 cm. Unfortunately, Mitsubishi has announced that production of all of these modules will be wound down to zero by March of next year. However, all is not lost. They will be replaced by the RA series of modules fabricated using MOSFET technology. The packaging will be much the same but higher gains and better efficiency will be obtained. No idea on pricing at this stage however. So, if you are contemplating a project using one of the Mitsubishi modules, have a look at the RA series.

Digital Modes

Rex Moncur – VK7MO

Guy VK2KU introduced an improved procedure for terrestrial JT44 at Gippstech and this is now recommended for use in VK-ZL. The example below is for a sked between VK2KU and VK3XYZ. For more complete information on the procedures go to the NSW VHF DX Group web site at www.vhfdx.oz-hams.org then to Digital Modes and to JT44 operating procedures

Messsage Sent	Station Transmitting
VK2KUVK3XYZVK2KUVK3XYZ	VK3XYZ
VK3XYZVK2KU 1919191919	VK2KU
RRRRRRRRRR 2020202020	VK3XYZ
RRRRRRRRRRRRRRRRRRRR	VK2KU
7373737373737373737373	VK2XYZ

The reports in the format 19 or 20 above represent the signal level in dB below the noise with the minus sign omitted. Thus 19 indicates –19 dB in a 2.5 kHz bandwidth which is indicated on the WSJT program when using JT44.

The procedure allows one to take best advantage of the multiple averaging techniques built into JT44. In the first line both callsigns are repeated in full and one can average these by pressing the "Fold" button to give an extra 1.5 dB improvement. In the second line the callsigns are in the exact same position as when starting the contact so the call sign average in the bottom JT44 window can build up giving a 1.5 dB improvement for each doubling of the averaging time eg 3 dB after four cycles. The report in the second line is averaged in the double letter average to the right in JT44 giving around a 3 dB improvement and the RRR in the third line is averaged in the single letter average to the right in JT44 giving around 7 dB improvement.

Only send a report when you have received both call signs correctly. This tells the other station that you have both callsigns so the other station can move to line 3 as soon as they have both call signs. Only send RRRRR when you have received both call signs and a report correctly.

In this example it is possible to send both call signs twice in the first line and gain the averaging advantage of 1.5 dB in a single line. In cases where both stations have three letter callsigns it is not possible to include both in full and one cannot gain this advantage. In the case of two three letter calls the first line is as follows:

VK2ABC VK3XYZ VK3XYZ

2 m & 70 cm FM DX

Not a great deal of activity for FM DX through August with a few smaller openings and one good duct opening in the South East, plus a good opening along the VK4 coast.

On the evening of Friday 1st, confined enhancement was noted from here to the Grampians devices, Otways and Geelong area. Otways VK3ROW noted at S9 (486 km), Grampians 70cm VK3RWU noted at S9+10dB at 471 km.

The following evening David VK2AYO in Dubbo was noted working into the 146.950 repeater in Canberra speaking with VK2ZSZ, a distance of 341 km.

On the 3rd, enhancement still noted around central VK2 and northern VK3.

On the morning of the 13th of August, a duct was workable along parts of the VK4 coastal area. Felix VK4FUQ in Ingham, 100 km North of Townsville, was able to work into the Gladstone repeater at Amy's Peak on 146.900 VK4RGA. Distance involved for Felix is 805 km, Felix was in contact with Gary VK4TGB in Bundaberg and also Alan

Robin Harwood VK7RH

Seasonal momentum

Spring has certainly arrived at this location after a rather wet winter for northern Tasmania. Already I notice that the higher frequencies are starting to propagate for longer into the evening hours.

Of course, this month sees the re-introduction of Daylight Saving in NSW, the ACT, SA and Victoria on the 26th of October, which also happens to be the date when the Northern Hemisphere reverts back to their respective standard timezones. This has been deliberately chosen as the date when a massive frequency shift occurs to take account of these seasonal changes. It is also the date of programming changes and alterations. I believe even fewer international stations will be broadcasting to Australasia and the South Pacific from that date.

There also has been a lot of recent discussion about DRM and I believe the first commercial receiver should shortly be available. However I do not think there will be too many buyers as the price I have seen quoted is approximately 750 euros. The majority of listeners using shortwave are in the developing world with limited incomes. I know that a software package is available for downloading but it too is rather high and requires a decoder to go between the receiver with a 12 kHz wide IF strip and the computer soundcard. There are few stations broadcasting DRM to this region and I believe that they have been almost exclusively concentrating on Europe and North America but with so few equipped with the right gear, it remains a rather open question whether DRM will survive. I also noted that the proponents of DRM and the DAB, also known as Eureka 147, would be working together. The IBOC system in the US is still regarded as experimental and again depends on how quickly receiving modules will be in the market place

Radio New Zealand International was silenced by a failure of their sender near Taupo early in September. Their Internet audio feed was unaffected but they quickly had to hire airtime over Radio Australia between 1700 and 2115 on 9580. I imagine that they will be back from their own senders by now. They were planning to broadcast and extend their operational hours to 24 hours as from September 7th.

There has been no news on the fate of Radio for Peace International in Costa Rica. Mediation talks between the University and RFPI were stalled at last report. The University wants the station off the campus and for them to vacate their buildings and studios. If they are forced to relocate they will have to apply to the Costa Rican government for a licence, as they would no longer be considered to be in "International territory".

I believe another Australian domestic shortwave station commenced recently, broadcasting from Humpty Doo in the NT. Information is that it is running less than 500 watts and provides spoken word programming in aboriginal languages. It is on 5050 yet is difficult to copy here in the evening hours due to the presence of several Chinese senders also on channel. I believe that this station is temporarily on shortwave until they get funding to put low power senders on the extended MW allocation or on FM across Arnhem Land.

The death of Boris Belitsky was announced on the Voice of Russia on 3rd September. He was the presenter of "Science and Engineering" on Radio Moscow' and the VOR's English programming. His diction and pronunciation were excellent, as was his incredible ability to explain difficult scientific and engineering terms in simple English. He was 82.

Well that is all for this month. Don't forget you can email your news and comments to me at vk7rh@wia.org.au.

73 from Robin VK7RH

VHF/UHF – An Expanding World *continued*

VK4EAB in Gympie, 150 km and 270 km respectively to the device. Felix was also accessing another unusual repeater on 146.950 but could not get any I.D Morse from it. I would think it could have been the device at Blackwater VK4RBD.

Very early morning on the 16th of August, a duct extended across to VK5 from southern VK2 and VK3 call areas. This appeared to hang in there all day and was gone some time after the sun went down in the evening. Many of the more easily accessible 2 m repeaters were workable from the east, including the likes of Murray Bridge, Lobethal, Crafers and Port Augusta.

VK3KYF, Garry in Mildura had an interesting day, not only working into VK2KRR near Wagga simplex, but also making the Wagga 2m repeater, Murray Bridge in VK5 and also Mt. Macedon in VK3. Some good distances there from Garry and around 480 km into Wagga. Terry VK3TCM again in Mildura was also working into Mt. Macedon, as was Brian VK5ZMB, a good signal from Gawler S.A. Barry VK5KBJ south of Adelaide was able to work simplex into VK2KRR on 2 m, a distance of 701 km with a 5/4 signal.

Thomas VK3HFZ was noted as working portable from the snow on Mt. Buller, providing contacts for those who were in range. Thomas was a 5/6 signal here near Wagga.

Finally, the Mt. Baw Baw repeater VK3RWG was brought back to life on the 9th of August and is putting out a good signal on 147.225.

The new repeater servicing the Echuca area, VK3RCA, is up and running on 146.675. Although running a borrowed mobile whip on transmit due to antenna problems, the device is still getting out OK and a new antenna is on the way. Well done to VK3JGL and VK3EME for the work on the project.

ar

HF Predictions

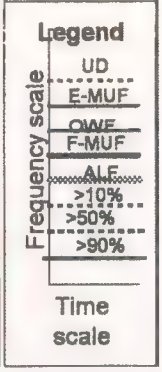
by Evan Jarman VK3ANI
34 Alandale Court Blackburn Vic 3130

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits.
These frequencies as identified in the legend are:-

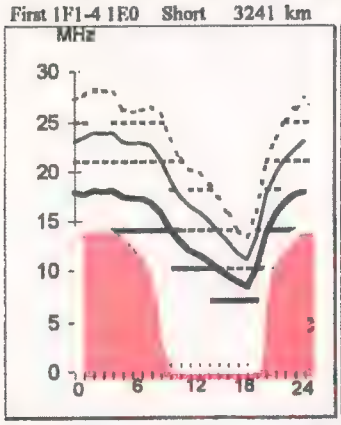
- Upper Decile (F-layer)
- F-layer Maximum Usable Frequency
- E-layer Maximum Usable Frequency
- Optimum Working Frequency (F-layer)
- Absorption Limiting Frequency (D region)

Shown hourly are the highest frequency amateur bands in ranges between these key frequencies, when usable. The path, propagation mode and Australian terminal bearing are also given for each circuit.
These predictions were made with the Ionospheric Prediction Service program: ASAPS Version 4

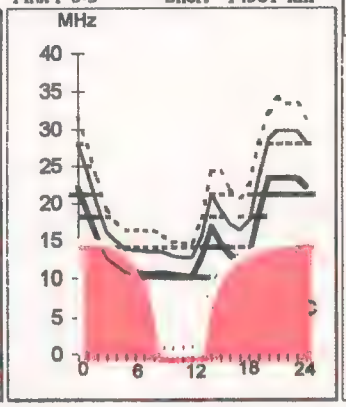
October 2003
T Index: 53



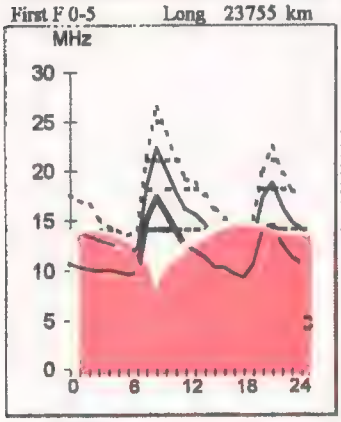
Adelaide-Auckland 104
First 1F1-4 1E0 Short 3241 km



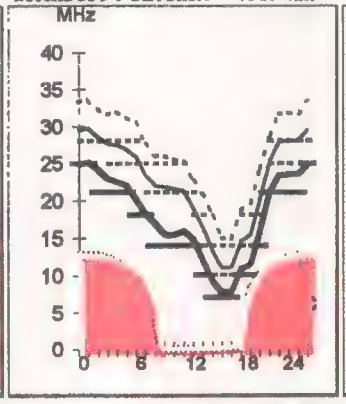
Brisbane-Chicago 57
First F 0-5 Short 14361 km



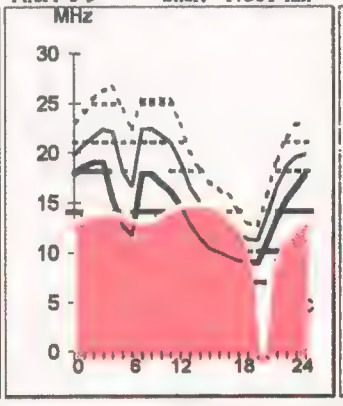
Adelaide-London 132
First F 0-5 Long 23755 km



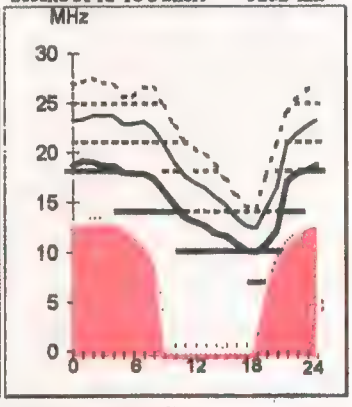
Brisbane-Honolulu 49
Second 3F5-9 3E(Short 7569 km



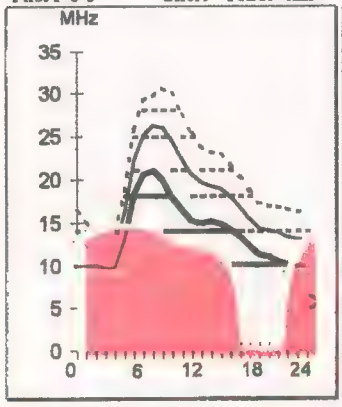
Canberra-Dakar 214
First F 0-5 Short 17361 km



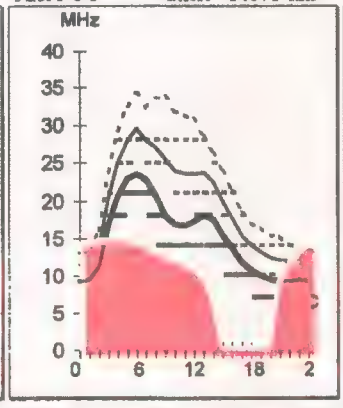
Darwin-Christchurch 139
Second 3F12-16 3 Short 5282 km



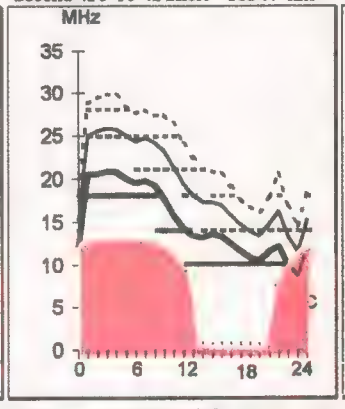
Adelaide-London 312
First F 0-5 Short 16269 km



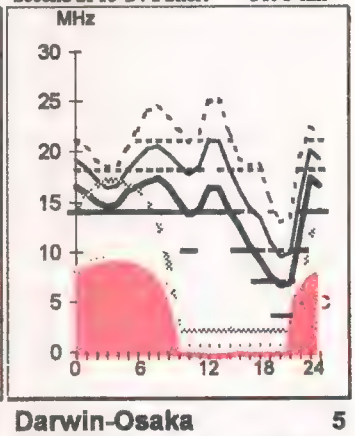
Brisbane-Moscow 321
First F 0-5 Short 14071 km



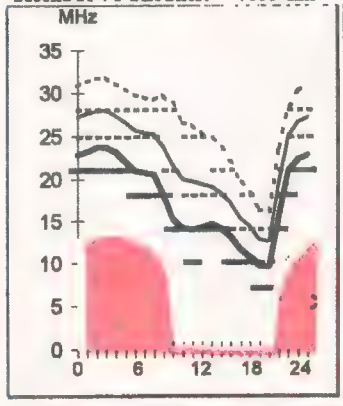
Canberra-New Delhi 303
Second 4F5-10 4E Short 10347 km



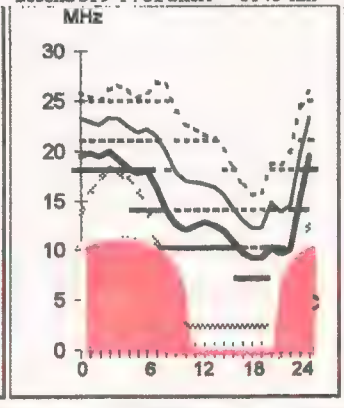
Darwin-Manila 340
Second 2F13-24 2 Short 3196 km



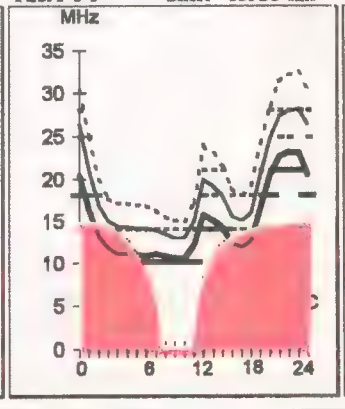
Adelaide-Tokyo 1
Second 3F4-9 3E(Short 7855 km



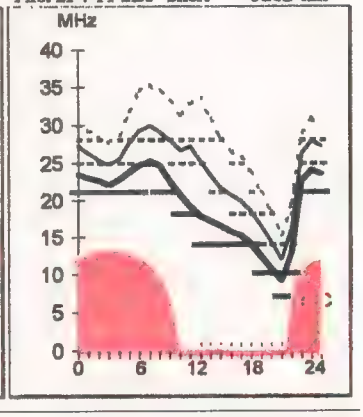
Brisbane-Singapore 293
Second 3F9-14 3E Short 6146 km



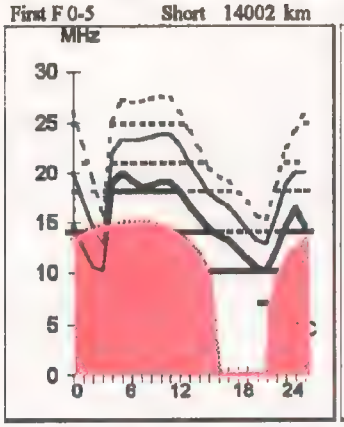
Canberra-Washingtor 70
First F 0-5 Short 15938 km



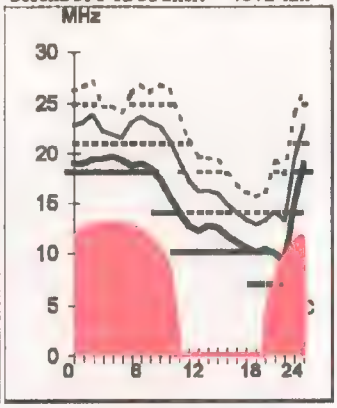
Darwin-Osaka 5
First 2F4-11 2E0 Short 5262 km



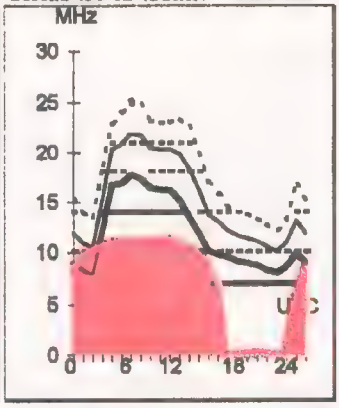
Hobart-Amman 283
First F 0-5 Short 14002 km



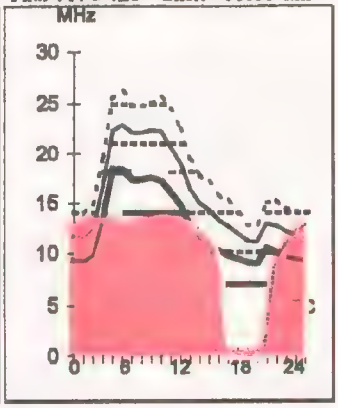
Melbourne-Bangkok 312
Second 3F6-12 3E Short 7372 km



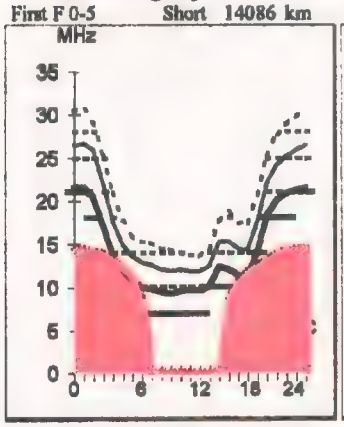
Perth-Harare 257
Second 4F8-12 4E Short 8496 km



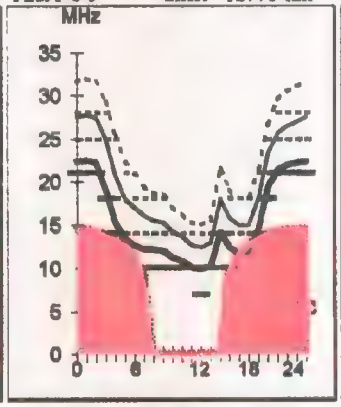
Sydney-Johanessbur 230
First 4 f4-8 4E0 Short 11035 km



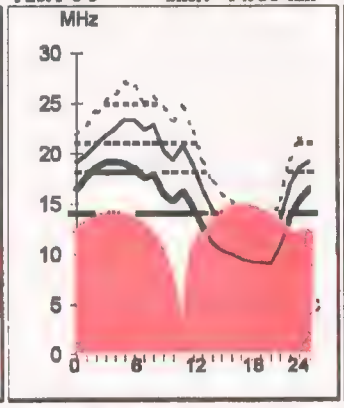
Hobart-Calgary 51
First F 0-5 Short 14086 km



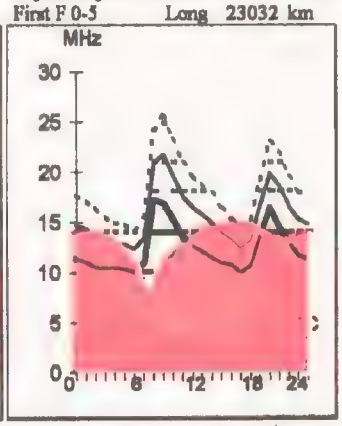
Melbourne-Los Angel 65
First F 0-5 Short 12771 km



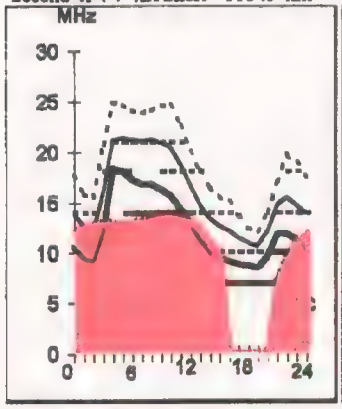
Perth-Lima 162
First F 0-5 Short 14930 km



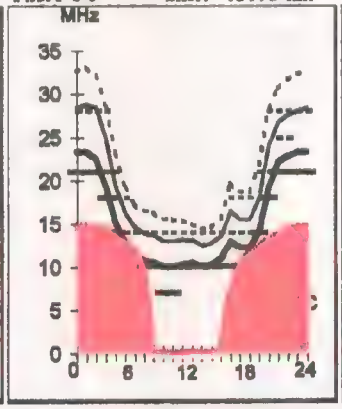
Sydney-London 139
First F 0-5 Long 23032 km



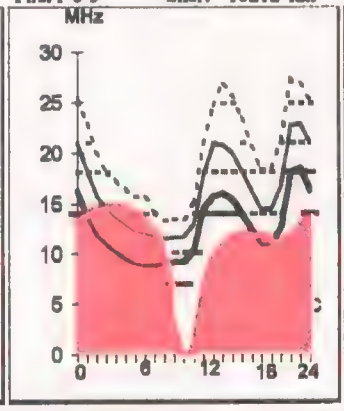
Hobart-Lusaka 239
Second 4F4-7 4E(Short 11045 km



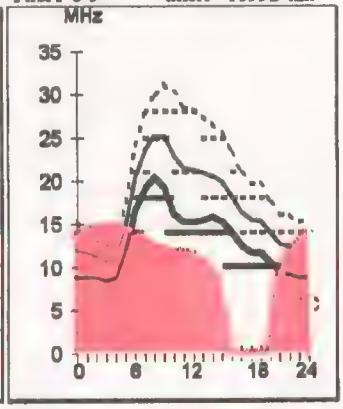
Melbourne-Seattle 50
First F 0-5 Short 13178 km



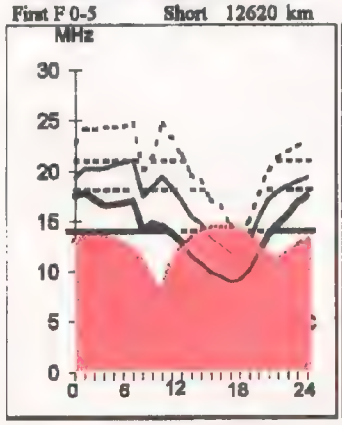
Perth-Ottawa 30
First F 0-5 Short 18212 km



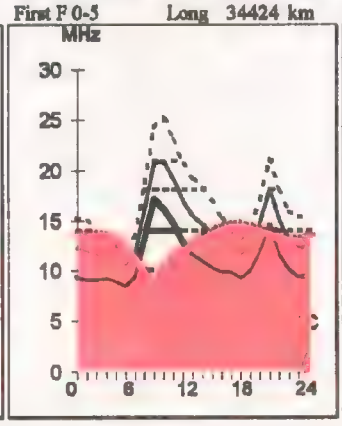
Sydney-London 319
First F 0-5 Short 16992 km



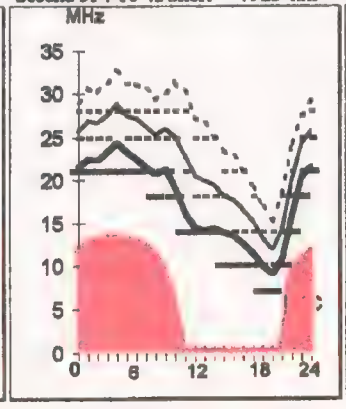
Hobart-Rio de Janeir 169
First F 0-5 Short 12620 km



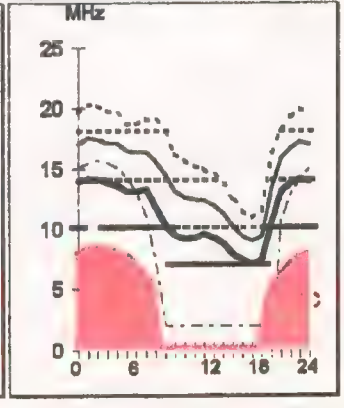
Melbourne-Stockholm 140
First F 0-5 Long 34424 km



Perth-Tokyo 20
Second 3F4-10 4E Short 7923 km



Sydney-Port Moresby 351
Second 2F17-22 2 Short 2740 km



Gridsquare Standings

at 27 August 2003

144 MHz Terrestrial

VK2FLR	Mike	107
VK2KU	Guy	100
VK3FMD	Charlie	82
VK2ZAB	Gordon	75 SSB
VK3BRZ	Chas	68 SSB
VK2KU	Guy	67 SSB
VK3EK	Rob	62 SSB
VK3KAI	Peter	62
VK2DVZ	Ross	60 SSB
VK2EI	Neil	54
VK3XLD	David	54 SSB
VK3TMP	Max	53
VK3CY	Des	52 SSB
VK3ZLS	Les	51 SSB
VK3BDL	Mike	50
VK2KU	Guy	47 Digi
VK7MO	Rex	47
VK3BJM	Barry	45 SSB
VK2TK	John	44
VK3KAI	Peter	44 SSB
VK3WRE	Ralph	44 SSB
VK2DXE	Alan	43
VK3CAT	Tony	39
VK3KEG	Trevor	39
VK4TZL	Glenn	38
VK4KZR	Rod	33
VK7MO	Rex	30 SSB
VK2TK	John	29 SSB
VK3HZ	David	28
VK3KME	Chris	28 SSB
VK6HK	Don	28
VK2KRR	Leigh	26 FM
VK4DFE	Chris	26 SSB
VK3ZUX	Denis	25 SSB
VK7MO	Rex	24 Digi
VK3YB	Phil	23
VK2TG	Bob	22 SSB
VK3KAI	Peter	21 Digi
VK6KZ	Wally	20
VK3BBB	Brian	19
VK3TLW	Mark	19 SSB
VK3AL	Alan	18 SSB
VK2TK	John	16 Digi
VK6KZ/p	Wally	16
VK3ZYC	Jim	14 SSB
VK3DMW	Ken	13
VK2CZ	David	12
VK2EI	Neil	11 Digi
VK2DXE/p	Alan	10
VK3ANP	David	10
VK7ZSJ	Steve	10
VK2TWO	Andrew	5
VK3ZDR	David	5 SSB
VK2AKR	Neil	3 Digi
VK3BG	Ed	3 SSB
VK2AKR	Neil	1 SSB

144 MHz EME

VK2FLR	Mike	110
VK2KU	Guy	73
VK3CY	Des	66 CW
VK3KEG	Trevor	4
VK3FMD	Charlie	3
VK2DVZ	Ross	2
VK7MO	Rex	2

432 MHz

VK2ZAB	Gordon	52 SSB
VK3BRZ	Chas	48 SSB
VK3XLD	David	46 SSB
VK3FMD	Charlie	41
VK3ZLS	Les	40 SSB
VK2KU	Guy	37
VK3EK	Rob	34 SSB
VK2KU	Guy	33 SSB
VK2DVZ	Ross	29 SSB
VK3BJM	Barry	29 SSB
VK3BDL	Mike	26
VK3KAI	Peter	26 SSB
VK3TMP	Max	25
VK3WRE	Ralph	25 SSB
VK3CY	Des	23 SSB
VK3KEG	Trevor	21
VK3HZ	David	18
VK7MO	Rex	16
VK3CAT	Tony	14
VK4KZR	Rod	14
VK2TK	John	13 SSB
VK3TLW	Mark	13 SSB
VK3ZUX	Denis	13 SSB
VK6KZ	Wally	13
VK4TZL	Glenn	11
VK3AL	Alan	10 SSB
VK3ANP	David	10
VK3YB	Phil	10
VK2TG	Bob	9 SSB
VK4DFE	Chris	9 SSB
VK3BG	Ed	8 SSB
VK3KME	Chris	8 SSB
VK6KZ/p	Wally	8
VK2KRR	Leigh	7 FM
VK3BBB	Brian	7
VK2FLR	Mike	6
VK2KU	Guy	5 Digi
VK3ZYC	Jim	4 SSB
VK2CZ	David	3
VK2TWO	Andrew	3
VK7MO	Rex	3 Digi
VK2DXE/p	Alan	2
VK3KAI	Peter	2 Digi
VK2AKR	Neil	1 SSB
VK3DMW	Ken	1

432 MHz EME

VK4KAZ	Allan	14 CW

1296 MHz

VK3XLD	David	32 SSB
VK3BRZ	Chas	31 SSB
VK3FMD	Charlie	31
VK2ZAB	Gordon	26 SSB
VK3ZLS	Les	26 SSB
VK2KU	Guy	21
VK3EK	Rob	20 SSB
VK2KU	Guy	19 SSB
VK3KWA	John	19
VK3WRE	Ralph	16 SSB
VK3KAI	Peter	15
VK3KAI	Peter	14 SSB
VK2DVZ	Ross	13 SSB
VK3BDL	Mike	12
VK3BJM	Barry	12 SSB
VK3TMP	Max	11
VK4KZR	Rod	10
VK7MO	Rex	10
VK2TK	John	8 SSB
VK3TLW	Mark	8 SSB
VK3AL	Alan	7 SSB
VK3HZ	David	6
VK2CZ	David	5
VK6KZ/p	Wally	5
VK3BVP	Shane	4
VK3YB	Phil	4
VK3ZYC	Jim	4 SSB
VK6KZ	Wally	4
VK2KU	Guy	3 Digi
VK3BBB	Brian	3
VK3BG	Ed	3 SSB
VK3KEG	Trevor	3
VK2DXE/p	Alan	2
VK2FLR	Mike	2
VK3CY	Des	2
VK3KAI	Peter	2 Digi
VK3KME	Chris	2 SSB
VK3DMW	Ken	1
VK3ZUX	Denis	1
VK4TZL	Glenn	1
VK7MO	Rex	1 Digi

2.4 GHz

VK3BRZ	Chas	11 SSB
VK3XLD	David	11 SSB
VK3FMD	Charlie	8
VK3WRE	Ralph	8 SSB
VK3KAI	Peter	7 SSB
VK3EK	Rob	5 SSB
VK6KZ	Wally	4
VK3BJM	Barry	3 SSB
VK3KAI	Peter	2 Digi
VK4KZR	Rod	2
VK3TLW	Mark	1 SSB
VK4TZL	Glenn	1

3.4 GHz

VK3FMD	Charlie	8
VK3WRE	Ralph	6 SSB
VK3KAI	Peter	5 SSB
VK3XLD	David	4 SSB
VK6KZ	Wally	4
VK3EK	Rob	3 SSB

5.7 GHz

VK3FMD	Charlie	10
VK3WRE	Ralph	9 SSB
VK3KAI	Peter	7 SSB
VK3XLD	David	5 SSB
VK6KZ	Wally	4
VK3BJM	Barry	2 SSB
VK3EK	Rob	2
VK6BHT	Neil	2
VK3KAI	Peter	1 Digi

10 GHz

VK6BHT	Neil	9
VK3FMD	Charlie	8
VK3WRE	Ralph	8 SSB
VK3KAI	Peter	7 SSB
VK3XLD	David	7 SSB
VK3EK	Rob	5 SSB
VK6KZ	Wally	5
VK3TLW	Mark	3 SSB
VK3ZYC	Jim	3 SSB
VK2EI	Neil	2
VK3BJM	Barry	2 SSB
VK7MO	Rex	2
VK4KZR	Rod	1
VK4TZL	Glenn	1

24 GHz

VK6BHT	Neil	3
VK2EI	Neil	2
VK6KZ	Wally	2

474 THz

VK7MO	Rex	1

Additions, updates and requests for the guidelines to Guy VK2KU, vk2ku@hermes.net.au, or by mail (QTHR 2002).

The guidelines (and the latest League Table) are also available on the website of the NSW VHF Dx Group at www.vhfdx.oz-hams.org - click on Gridsquares.

Next update of this table will be in November 2003.

Stations who do not confirm their status for more than 12 months may be dropped from the table.

Charlie or Canada?

Probably Peter Cossins has not been around for as long as many of us and so his remarks re Poor Communications Vocabulary are understandable, if not indicating a knowledge of past history of phonetic alphabets.

In spite of the inference in Peter's letter, the amateur operators' phonetic alphabet of America, Boston, Canada through to Zanzibar is very much older than the present Alpha, Bravo, Charlie alphabet. It was used long before I got my licence, and that is nearly 50 years ago. I rather suspect it dates back to the 1930s. In support of this "countries" phonetic alphabet, it is universal, and the phonetic difference between the countries and cities used is quite marked. It is easy to follow no matter what country the amateur belongs to. It is not dependent on a knowledge of the English language. Tokyo is Tokyo all over the world and so is Zanzibar. The alphabet is certainly international, and it has been in place for a very long time - well over 50 years.

In the matter of phonetic alphabets, there have been several changes made in the official standard alphabet. In 1941 we had Ack, Beer, Charlie, etc which was later changed to Able, Baker, Charlie. Then later came Alpha, Bravo, Charlie. Charlie stood alone, unchanging. I remember the hilarity among the troops when the Don Rs (despatch riders) of the earlier phonetic alphabet in 1941 became Dog Rogers in the 1940s.

Peter, I think you are a voice crying in the wilderness. America, Boston, Canada, have been with us for a very long time, and I can't see it changing among the older amateurs.

Bob Elms VK6BE

Views expressed in the 'Over to you' column are those of the authors, and do not necessarily reflect the policies of the Wireless Institute of Australia.

Send contributions to:
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Amateur Radio Magazine
34 Hawker Crescent
Elizabeth East SA 5112
or email:
edarmag@chariot.net.au

Circuit Board Manufacture

In AR July 03 VK2COX sought a simple computer program for the design of printed circuit boards. There is none better than Easytrax (which includes Easyplot for printing/plotting the finished design). Easytrax is obsolete in the commercial world but is still excellent for amateur use; it has the added attraction of being freely available at zero cost.

Like VK2COX I have tried other programs; I have Eagle and Vectron and, whilst I'm sure they are excellent tools, they are complex and not intuitive. Easytrax wins on both counts; it runs in DOS (no mouse) and it uses keystrokes which are highly intuitive. for example, to Place a Track you hit PT, to Delete a Pad you hit DP and so on.

The best source for Easytrax is at RCS Radio in Sydney (*www.cia.com.au/rcsradio*). As well as free download of the program plus enhancements (or a floppy disc at nominal charge) you will find Bob Barnes a wonderful source of information and advice (and a delightful man).

This advice may, however, only partly solve VK2COX's problem. The usual photographic techniques for board production are not well-suited to occasional one-off production. These techniques require darkroom facilities and the use of chemicals which have a short storage life; this can be accommodated by those amateurs who are also keen photographers but most of us find converting the laundry to a darkroom a fearful pain.

I produce good-quality boards by plotting from Easytrax/Easyplot directly to the copper stock then etching as usual. This procedure is used to produce normal through-hole boards, surface-mount boards and microstrip boards.

Once laid-out in Easytrax (often very time-consuming and always an intellectual challenge) a board takes about half-an-hour to plot and etch. A mistake or a design change? Edit the design (saved in Easytrax) and plot/etch again; doesn't take very long.

Small plotters are now obsolete, replaced by laser printers. I paid $50 for my first plotter, a HP7550, but was later given two HP7475's (one virtually unused, in original packing with all manuals) for nothing; these are smaller than the 7550 and do the same job; their advantage is that they require less bench space.

Easytrax contains drivers for other brands of plotter, such as Roland, and these should be just as easy to acquire and get going.

I am a recognised computer-illiterate, yet I managed to get my system going; anyone can do it!!

Kerry Power VK2TIL

PC Board manufacture

In the July AR, VK2COX asked about an easy method to produce artwork for home brew PC boards.

Well, I have been making my own PC Boards for about 25 years and almost every board has been for a one-off project. I started by hand drawing my artwork on 0.1" square graph paper left over from my school days. I marked out the board with a Dalo Pen and etched it with Ferric Chloride.

Over the years I have tried more modern methods such as PCBreeze and EasyTrax software. The latter was good once I got to know it, but it lulled me into a false sense of thinking I could do impossible things like running thin lines between IC pads. I also tried the Toner Transfer System of direct transfer of artwork from printer to board, but it produced worse results than my Dalo pen.

I found rub-on transfer patterns were slow and inflexible. The only process I didn't try is the photographic approach, because I considered the materials too expensive for one-offs.

So I have reverted to my hand drawn graph paper artwork, my Dalo pen and Ferric Chloride. With care, I can produce single or double-sided boards of some complexity. If more layers are required for say, a microcontroller board, I use wire wrapping in conjunction with a double sided etched board.

Drilling holes has always been a problem when they have to be in line for a DIL IC socket. I now use a scrap piece of Vero board as a drill guide to accurately position such holes.

Peter Stuart VK2BEU

Over to you

May I add a bit to the CW controversy:

A word for CW.

"Oh, not again!" some will say. First of all congratulations to Drew VK3XU for his fine article on CW in August AR.

Yes, I am an ardent supporter of CW. I lived and worked for long years in S. E. Asia and I think of all the young Ham ops in countries with "difficult" languages, e.g. Thai with some 76 "letters"; or think of Chinese with many dialects, African languages etc. Their spoken English very often is rather limited and to this you add the natural shyness to speak a foreign language for fear of bad pronunciation and you know why they escape to 2m local language "chats". And we miss a good number of QSOs with exotic DX stations. But with CW, good knowledge of Q-code and basic "ham-speak", they can run QSOs with all the world!

In 1977, the beginning of Ham-Radio in Thailand, it was mostly foreigners who were DX-active, but when the 3 of us, HS1WR, HS1BG and myself HS1ALK ran the CW-side of HS0SEA contest station with a stunning result, everybody wanted to get into CW. From just about 100 members of RAST that time, look at the far over 1000 ops now.

Let's keep CW an important part of our hobby to communicate with all the world!

PS I don't have a VK-call as my brain seems too old to cope with the technical side of the exam but I could pass any CW up to 16+ WPM.

Hans Kiesinger L40370 ex-HS1ALK

New Noise Source

Added to the interference we already experience from various domestic appliances, there is a new sound affecting reception on the broadcast and short wave bands. The source is new-fangled "inverter" type domestic reverse- cycle air conditioners.

These machines are microprocessor controlled and use a variable speed motor to drive the compressor.

The controller is active whenever power is applied to the unit, whether or not it is heating or cooling.

The Operation Manual offers a warning that radio and TV units should be kept at least one metre away from the air-conditioner outside unit.

This is, in my experience, insufficient.

My Daiken unit, model FTX35, generates repetitive noise on near-by portable receivers that over-rides broadcast station signals on the low end of the broadcast band. Similar broadband noise is heard on 160, 80 and 40 metre amateur bands as well as around 5 MHz.

Daiken has formal documentation that says one of their units when tested met the Australian Standard" (whatever that might be).

I have been unable to obtain a copy of the test conditions that these units are supposed to meet. Probing around the unit with a dual band portable radio shows unreasonably loud broadband radiation, suggesting that the Australian "Standard" is not sufficiently strict.

A mains filter is not fitted by the manufacturer and a filter at the GP outlet powering the unit is too far from the source to make a difference.

Any attempt to add shielding or ferrite bead filtering will, I was told, invalidate the warranty- as will opening the unit to access the schematic said to be inside.

ACA is aware of the situation but says there is insufficient evidence of a wide-spread problem to warrant investigation.

Would anyone who has faced a similar situation please Email details to me at colharv@hotmail.com.au or phone on (02) 62813607

Col Harvey VK1AU

Silent Key

"Snow" Hodder VK2DV

It is with deep regret that we record the passing of Frederick Alexander "Snow" Hodder VK2DV on Saturday 30 August 2003. "Snow" was born in Edgecliff in May 1917 and joined the Waverly Radio club in the early 1930s. He gained his AOCP in 1935. His first call sign was VK2DV which he held continuously for 68 years. Six years ago, "Snow" received a certificate from the WIA in recognition of 62 years of membership. A short time prior to his passing, "Snow" was awarded life membership of the Oxley Region Amateur Radio Club.

After working for companies including Stromberg-Carlson, Tasma, Weldon, Philips, Kriesler and STC he joined the RAAF as a career in 1937. In 1938, "Snow", now living in Double Bay, added an extension to his Amateur Licence, and gained approval to operate an experimental broadcast station on 1240 kHz. His chosen experimental time slot was from Midnight on Fridays until dawn on Saturdays when he would play music from his collection of recordings. After returning from World War 2, "Snow" undertook study at the Marconi School of Wireless to gain his First Class Commercial Operator's Certificate of Proficiency, and his Broadcast Station Operator's Certificate of Proficiency. This led to a 10 year career as an aviation ground engineer with AWA, mainly stationed at Mascot Airport in Sydney. Opportunity then again beckoned him to the Government where he worked on defence projects, notably the IKARA Anti-Submarine system and anti-tank devices that were developed in the Woomera area. "Snow" retired in the late 70's and moved to Port Macquarie where he joined the Oxley Region Amateur Radio Club and continued to actively enjoy his hobby of amateur radio.

"Snow" is survived by his children, Pat, Carol and Bruce, and their families. His funeral was held at Port Macquarie on Thursday 4 September 2003.

Vale "Snow" Hodder VK2DV

Submitted by Henry Lundell VK2ZHE on behalf of the Oxley Region Amateur Radio Club

The Silent Key Forest Memorial

A living memorial to radio amateurs

A gift of trees is a gift of love, remembrance and deep regard.

The idea of establishing the "Silent Key Forest was the conception of five radio amateurs—Ozzie Oshrin (Zvi) 4X4CW (SK), Shimshon Lotan (Sammy) 4X4GF (SK) (May their memory be blessed); and Shlomo Menuhin 4X1AS, Ahron Kirschner 4X1AT, and Tuvia Gringroz 4X4GT.

It all began in the mind of the late Ozzie (Zvi) Osrin 4X4CW (SK), who wanted to establish a Memorial Forest of trees for all the radio amateurs of the world. He had been a radio man, a captain in the South African Air Force and later served with the Israel Defence Forces. He was also the first officially licensed radio amateur in Israel.

As the years went by, the late Shimshon "Sammy" Lotan 4X4GF (sk), joined him in developing and implementing this idea, accompanied by:

Shlomo Menuhin 4X1AS, Ahron Kirschner 4X1AT, Tuvia Gringroz 4X4GT

In 1983/4, 4X4CW, 4X4GF, 4X1AS, 4X1AT, 4X4GT, and 4Z4ZB (SK), met in Shoresh with the IARC executive, each one of the aforementioned pledging 100 trees, and the project began to take shape.

4X4GF, a real steam-roller, who was known for his monthly motor tours of the country for hams, got things into the implementation stage. Along with 4X1AT he arranged a meeting in Jerusalem with the head of the J.N.F. forestation department, and after a few more meetings, a site was found on the hills between Modi'in and the Tel Hadid ridge.

The Ben Shemen Forest, verdant with more than several million trees, is located halfway between Jerusalem and Tel Aviv. The more than 8,500 acres include pine, cypress and eucalyptus trees.

A project was set up under the joint auspices of the Jewish National Fund and the Israel Amateur Radio Club.

A radio amateur will always look for a great QTH (location) from which signals will "get out" in the best possible manner, and here it was.

On the 22nd of October 1985, with the presence of dignitaries from the Government and the J.N.F., the first inscribed boulder was erected for the first thousand trees. Two more boulders were established later in memory of 4X4CW and 4X4GF respectively.

The purpose of the forest is, to be a place to plant trees in Memory of Radio Amateurs who have passed away, "Silent Keys", as well as in Honor of living amateurs.

The project envisions groves of 1,000 trees contributed by clubs and individuals all over the world - which would be marked by attractive plaques. The first 4 groves in honor of Israeli Radio Amateurs have been dedicated. Donations of individual trees receive handsome certificates. It is a place for events, get-togethers of hams, field days and remembrance.

Field days and radio operations are activated from the "Silent Key Forest" with the special call sign "4X4SKF". Please don't forget that in addition to the special "4X4SKF" QSL card, a certificate is awarded for every donation of trees in the name of the person honored.

We shall remember our fellow amateurs who are no longer with us, their memory will be alive with us.

Individuals planting a tree will establish a living link with those who have filled the airwaves for so many years.

This Forest is unique in the entire World.

POST SCRIPT: Further information on this wonderful memorial forest can be found on www.iarc.org once there look for Silent Key Forest.

Should you like to plant a tree in memory of a friend please send the following information to the President of the IARC

Joseph Obstfeld 4X6KJ,
Post Office Box 873
Kiriat Ono, 55108 Israel

For planting a tree in the SK Forest, the following information is needed:

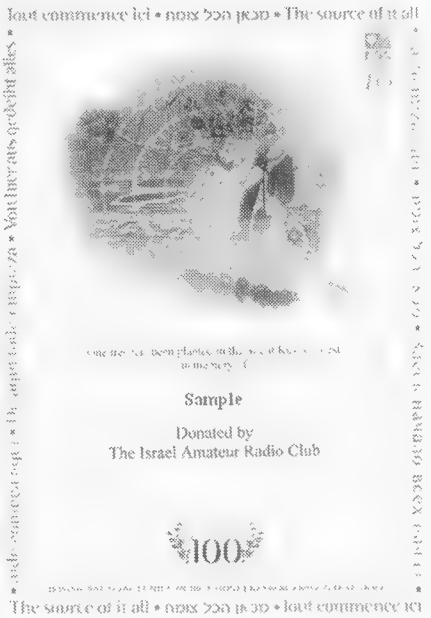
"To plant a tree in memory of... / or in Honor of.....

Name and Call Sign of the "Silent Key" or Name only

Who is to " donor " meaning which name should be filled in under "donor".

The price is 10 (ten) US dollars for each tree. Cheques should be payable to "Keren Kayemet le Yisrael"

After processing the "donor" will receive a Certificate from the Keren Kayemet.



HAMADS

classifieds

Free service to WIA members

FOR SALE NSW

• **Tektronic Storage CRO-7834** + spectrum analyser + accessory trolley & handbook incl. Send offer to gscott@albury.net.au.

WANTED NSW

• **CASIO FX-702P pocket computer**. Claudio VK2DLC Phone 02 6238 0041 evenings.

• **Workshop manual for Yaesu FT-747GX**, all costs defrayed. VK2DJR QTHR, email gbud@dnet.aunz.com

FOR SALE VIC

• **Yaesu VX-IR micro dual band H/H.** Comes with A/C charger. Extras include 30 watt linear, new spare lithium battery, filtered D/C power adaptor, carry case and external ant. adaptor. All in as new cond. $300. Ted VK3KTF QTHR, Phone 03 5367 4439, Mobile 0427 674 439.

• **Geloso VFO and dial, five band** on 19 inch panel and chassis $100. Transformer, very big, 230 to 110V, $10. Scaler unit for 19" rack with seven Nixie tubes, drivers and controls, $20. Collector's item. VK3DS, Phone 03 5332 3226.

• **4CX250BC Pair new Ceramic Tubes** rated 250 watts each up to 500 MHz for home brew Linear Amplifier or for Codan type HF rigs. Price $220.00 the pair. Don VK3KDT QTHR, email vk3kdt@alphalink.com.au

WANTED VIC

• **Circuit diagram for Philips SSWB radio telephone SC-108** Serial No. 3114. Tony VK3PTV, Phone 03 9729 1513.

• **Kenwood R-820 receiver** in top condition, also **SP-820** ext. speaker. Damien VK3RX Phone 03 5427 3121 Email vk3rx@wia.org.au

FOR SALE QLD

• **ATN 13-30 Log Periodic**, 8 element, HF antenna boom, 8 metres, all fittings stainless, in perfect condition $500. **Create RC5A-2** heavy duty rotator, $500. Bob VK4ABR, Phone 0419 964763

WANTED QLD

• **UART IC MM-5303N** or equivalent, also **100 VPS shutted tuning fork** for RTTY restoration project. Price . Gwen VK4CB Phone 07 3202 7137.

• Can anyone scan and e-mail **circuit diagram Sea Com 40c**? Thanks vk4axm@dodo.com.au

FOR SALE WA

• **Magazines for sale**: Electronics Aust 1972 to 1999. Unable to store any longer. 50 cents each. VK6BSS, Phone 08 9941 1993.

FOR SALE TAS

• **Icom 746 HF tcvr** 160 - 2m 100 W output, auto tuner, mint, boxes, manuals, mic. Hardly used, $1980. **Heil Pro-5+5** head set, remote switch wired Icom 8 pin, new $150. **Icom V-8000** Service man new $25. **Icom BU-1** mem backup unit **IC-290, IC-490**, new $15. Allen VK7AN Phone 03 6327 1171 or 0419 755 124

TRADE ADS

PSK-31, SSTV, RTTY SOUNDBOARD Interfaces Fully isolated, ready to plug in. http://www.G3LIV.CO.UK, johnny@melvin.com, G3LIV QTHR.

About hamads....

- Hamads may be submitted by ***email*** or on the ***form on the reverse of your current Amateur Radio address flysheet.*** Please print carefully and clearly, use upper AND lower case.
- Separate forms for For Sale and Wanted items. Please include name, address STD telephone number and WIA membership number if you do not use the flysheet.
- Eight lines (forty words) per issue free to all WIA members, ninth and tenth lines for name and address. Commercial rates apply for non-members.
- Deceased estates Hamads will be published in full, even if the ad is not fully radio equipment.
- WIA policy recommends that the serial number of all equipment for sale should be included.
- QTHR means the address is correct in the current WIA Call Book.
- Ordinary Hamads from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.
- Commercial advertising (Trade Hamads) are pre-payable at $25.00 for four lines (twenty words), plus $2.25 per line (or part thereof), Forty word maximum, minimum charge of $25.00. Cheques are to be made out to: WIA Hamads.
- Copy typed or printed clearly please, and received by the deadlines shown on page 1 of each issue of Amateur Radio.

Email: *newsletters@ozemail.com.au* **Fax:** *03 9756 7031*

Postal: *Newsletters Unlimited, PO Box 431, Monbulk Vic 3793*

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It is impossible for us to ensure that the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore, advertisers and advertising agents will appreciate the absolute need for themselves to ensure that the provisions of the Act are strictly complied with.

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All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

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MISCELLANEOUS

- **FREE coaching** via mail and email by professional radio engineer. All theory subjects in all licence grades and upgrades. Lindsay Lawless VK3ANJ Box 760 Lakes Entrance Vic.3909 and email: linlawless@net-tech.com.au
- **The WIA QSL Collection (now Federal) requires QSLs.** All types welcome, especially rare DX pictorial cards, special issue. Please contact the Hon Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, tel. (03) 9728 5350

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3/237 Bluff Road
Sandringham VIC 3191

or call Arthur VK3VQ on **03 9598 4262** or Allan VK3AMD on **03 9570 4610**, for an application form.

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- **Major role in amateur radio education**
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"There is no denying that radio today still has all the magic that attracted people to the hobby all those years ago, when it first emerged onto an unsuspecting world."

Ernie Hocking, President
Amateur Radio April 2002

How to join WIA

- **Through your local amateur radio club**
- **Through your Division (contact details on page 56)**
- **Contact WIA Federal Office (03) 9528 5962**

Division Directory

The Amateur Radio Service exists for the purpose of self training, intercommunication and technical investigation. It is carried out by amateurs who are duly authorised people interested in radio technique solely with a personal aim and without pecuniary interest.

The Wireless Institute of Australia represents the interests of all radio amateurs throughout Australia. National representation is handled by the executive office under council direction. There is one councillor for each of the seven Divisions. This directory lists all the Divisional offices, broadcast schedules and subscription rates. All enquiries should be directed to your local Division.

Broadcast schedules All frequencies MHz. All times are local.

VK1 Division Australian Capital Territory,
GPO Box 600, Canberra ACT 2601

President	Alan Hawes	VK1WX
Secretary	Deane Walkington	VK1DW
Treasurer	Bob Howie	VK1HBH

VK1WI transmits each Thursday evening at 2000 hrs local time on VK1RGI 146.950 MHz and 438.375 MHz including the linked repeater system on VK2RGN Goulburn, VK2RHR High Range, VK2RMP Madden Plains and VK2RTW Wagga Wagga.
VK1 Home Page *http://www.vk1.wia.ampr.org*
Annual Membership Fees. Full $80.00 Family $38.75 Pensioner or student $71.00. Without *Amateur Radio* $48.00

VK2 Division New South Wales
109 Wigram St, Parramatta NSW
(PO Box 9432, Harris Park, 2150)
(Office hours Tue., Thu., Fri., 1100 to 1400 hrs.)
Phone 02 9689 2417
Web: *http://www.wiansw.org.au*
Freecall 1800 817 644 (NSW only)
e-mail: *vk2wi@wiansw.org.au*
Fax 02 9633 1525

President	Brian Kelly	VK2WBK
Secretary	Owen Holmwood	VK2AEJ
Treasurer	Noel May	VK2YXM

VK2WI transmits every Sunday at 1000 hrs and 1930 hrs on some or all of the following frequencies (MHz): 1.845, 3.595, 7.146, 10.125, 14.170, 18.120, 21.170, 24.950, 28.320, 29.170, 52.150, 52.525, 144.150, 147.000, 432.150, 438.525, 1273.500. Plus many country regions on 2m and 70cm repeaters. Highlights are included in VK2AWX Newcastle news Monday 1930hrs. on 3.593 , 10 metres and local repeaters. The text of the bulletins is available on the Divisional website and packet radio. Continuous slow morse transmissions are provided on 3.699 and 145.650. VK2RSY beacons on 10m, 6m, 2m, 70cm and 23cm. Packet on 144.850.
Annual Membership Fees. Full $80.00 Pensioner or student $63.00. Without *Amateur Radio* $50.00

VK3 Division Victoria
40G Victory Boulevard Ashburton VIC 3147
(Office hours Tue 10.00 -2.30)
Phone 03 9885 9261
Web: *http://www.wiavic.org.au*
Fax 03 9885 9298
e-mail: *wiavic@wiavic.org.au*

President	Jim Linton	VK3PC
Secretary	John Brown	VK3JJB
Treasurer	Jim Baxter	VK3DBQ

VK3BWI broadcasts on the 1st Sunday of the month at 20.00hrs Primary frequencies, 3.615 DSB, 7.085 LSB, and FM(R)s VK3RML 146.700, VK3RMM 147.250, VK3RWG 147.225, and 70 cm FM(R)s VK3ROU 438.225, and VK3RMU 438.075. Major news under call VK3ZWI on Victorian packet BBS and WIA VIC Web Site.
Annual Membership Fees. Full $83.00 Pensioner or student $67.00. Without *Amateur Radio* $51.00

VK4 Division Queensland
PO Box 199, Wavell Heights, Qld. 4012
Phone 07 3221 9377
e-mail: *office@wiaq.powerup.com.au*
Fax 07 3266 4929
Web: *http://www.wia.org.au/vk4*

President	Ewan McLeod	VK4ERM
Secretary	Bob Cumming	VK4YBN
Treasurer	David Gulley	VK4DCG

EVERY SUNDAY, at 9am LOCAL (Sat 2300 UTC). From Far North Queensland On 7.070/2 MHz. From South East Queensland:- 1.825, 3.605, 7.118, 10.135, 14.342, 21.175, 52.525, 147.000, 438.500 MHz. Right throughout VK4 scan 146.6 to 148.0 MHz again at 9am local. SUNDAY 6:45pm hear LAST week's QNEWS broadcast 3.605 and 147.0 MHz from South East Queensland. MONDAY 7:00pm hear YESTERDAY's news again on 146.875 MHz broadcast from Brisbanes Bayside repeater, and then 7:30pm on 3.605 and 147.0 MHz from Sth East Queensland. Text editions on packet internet and personal email, visit www.wia.org.au/vk4 News is updated 24/7 in both text and audio on this site. MP3 Audio from same website by 2300 hours each Saturday. Contact QNEWS, packet sp QNEWS@VK4WIE.BNE.QLD.AUS.OC email qnews@wia.org.au
Annual Membership Fees. Full $95.00 Pensioner or student $81.00. Without *Amateur Radio* $69.00

VK5 Division South Australia and Northern Territory
(GPO Box 1234 Adelaide SA 5001)
Phone 08 8294 2992
web: *http://www.sant.wia.org.au*
email: *peter.reichelt@bigpond.com*

President	Trevor Quick	VK5ATQ
Secretary	Peter Reichelt	VK5APR
Treasurer	Trevor Quick	VK5ATQ

VK5WI: 1843 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.800 FM Mildura, 146.900 FM South East, 146.925 FM Central North, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 LSB, 7.065 LSB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. The repeat of the broadcast occurs Monday Nights at 1930hrs on 3585kHz and 146.675 MHz FM. The broadcast is available in 'Realaudio' format from the website at www.sant.wia.org.au Broadcast Page area.
Annual Membership Fees. Full $88.00 Pensioner or student $73.00. Without *Amateur Radio* $58.00

VK6 Division Western Australia
PO Box 10 West Perth WA 6872
Phone 08 9351 8873
Web: *http://www.wia.org.au/vk6*
e-mail: *vk6@wia.org.au*

President	Neil Penfold	VK6NE
Secretary	Roy Watkins	VK6XV
Treasurer	Bruce Hedland-Thomas	VK6OO

VK6WIA: 146.700 FM(R) Perth at 0930hrs Sunday relayed on 1.865, 3.564, 7.075, 10.125, 14.116, 14.175, 21.185, 29.120 FM, 50.150 and 438.525 MHz, Country relays 3.582, 147.200 (R) Cataby, 147.350 (R) Busselton, 146.900 (R) Mt William (Bunbury).147.000 (R) Katanning and 147.250 (R) Mt Saddleback. Broadcast repeated on 146.700 at 1900 hrs Sunday relayed on 1.865, 3.564 and 438.525 MHz : country relays on 146.900,147.000, 147.200, 147.250 and 147.350 MHz..Also in "Real Audio" format from the VK6 WIA website
Annual Membership Fees. Full $71.00 Pensioner or student $65.00. Without *Amateur Radio* $39.00

VK7 Division Tasmania
PO Box 371 Hobart TAS 7001
Phone 03 6234 3553 (BH)
Web: *http://www.wia.org.au/vk7*
email: *vk7dg@wia.org.au*

President	Phil Corby	VK7ZAX
Secretary	Dale Barnes	VK7DG
Treasurer	Dale Barnes	VK7DG

VK7WI: At 0930 hrs every Sunday on 146.700 MHz FM (VK7RHT, Hobart) and relayed on 147.000 MHz FM (VK7RAA, Launceston), 146.625 MHz FM (VK7RMD, Ulverstone), 146.750 MHz FM (VK7RNW, Ulverstone), 147.075 MHz FM (VK7RWC, Rosebery), 3.57 MHz LSB, 7.090 MHz LSB, 14.130 MHz USB and UHF CB Channel 15 in Hobart area.
Annual Membership Fees. Full $90.00 Pensioner or student $77.00. Without *Amateur Radio* $57.00

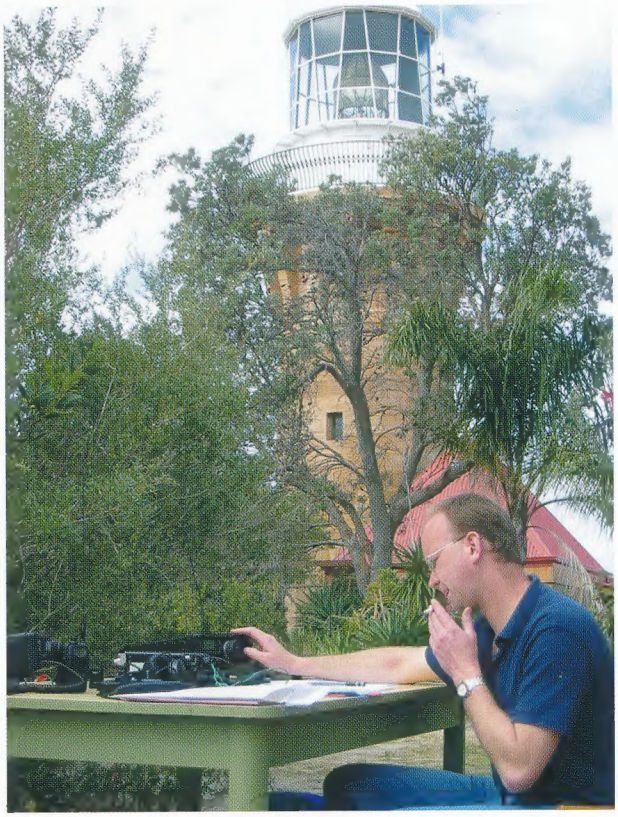
VK8 Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown, received on 14 or 28 MHz. The broadcast is downloaded via the Internet.

A Weekend at Barrenjoey Lighthouse

Richard Murnane VK2SKY

During the Lighthouse Weekend, the Manly-Warringah Radio Society station VK2MB went portable at Barrenjoey Lighthouse at Palm Beach, which coincidentally was open to the public for the first time on the Sunday.

Aerial view of Barrenjoey Lighthouse



Peter VK2IT at the mic

Club members setting up a Spiderbeam antenna used for 20/15/10m ops

See full story on page 11

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